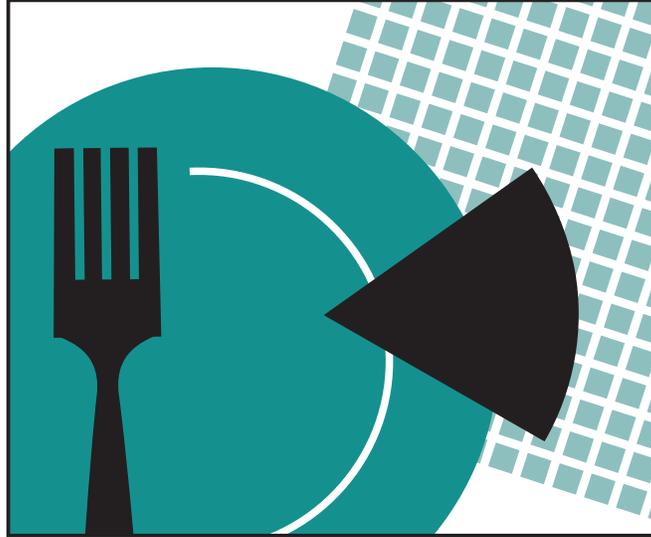

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Spotlight on the U.S. Food System

Once again we take our annual look at what Americans are eating, where they are purchasing their food, how much they are spending, and related topics of interest to farmers, the food industry, policymakers, and consumers.

In 1996, the share of food expenditures spent away from home fell slightly to 45.8 percent from 46 percent in 1995. Spending at restaurants, fast-food outlets, and other eating places rose 2.8 percent in 1996, smaller than the 3.7-percent increase in food spending at supermarkets, specialty foodstores, and other retail outlets.

With the economy growing, the overall unemployment rate at 5.4 percent for 1996, and incomes for many American households rising, why is spending for food away from home slowing? Are we eating out less often, or are we spending less when we eat out? Burger wars and value meal deals have kept fast-food outlet prices low, which may have slowed the growth in away-from-home food spending. Also, time-pressed consumers may be abandoning pricey, upscale restaurants for the growing number of more moderately priced, quick-service chains like Boston Market and Kenny Rogers Roasters.

Or consumers may be bypassing eating places, opting instead to pick up fully prepared dinners at the local supermarket. Grocery store deli departments have expanded into full-service offerings of "meal solutions" containing fully prepared entrees and side dishes (which carry a higher price tag than the raw ingredients). These options have contributed to the higher growth in at-home food spending during the last few years.

The abundance and variety of foods offered are also behind the growth in at-home food spending. Imported foods are capturing a growing role in our diets. For example, imports now account for 13 percent of our fresh fruit consumption (excluding bananas) compared with 7 percent 10 years ago, and for 9 percent of the rice we eat, up from 2 percent a decade ago. A strong dollar relative to other currencies has made imported foods relatively less expensive for U.S. consumers. In 1996, we imported \$27.8 billion worth of processed foods—up 11.2 percent over 1995, while exports of processed foods grew only 2.5 percent to \$30.1 billion.

With food safety remaining a pressing concern, this issue of *FoodReview* reports the latest estimates of the cost of foodborne illness—and for the first time includes costs of foodborne-related Guillain-Barré syndrome, the leading cause of acute paralysis in the United States. Seven foodborne illnesses alone cost society \$6.6 billion to \$37.1 billion in medical costs and lost productivity in the United States in 1996 (the wide range reflects the uncertainty over the number of cases that occurred and how to value a premature death). USDA's Economic Research Service is continually refining the estimates to help identify the most serious food-safety problems and seek the most cost-effective solutions.

Rosanna Mentzer Morrison
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Americans Consuming More Grains and Vegetables, Less Saturated Fat

Judy Putnam and Shirley Gerrior
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In 1996, each American consumed an average of 77 pounds more of commercially grown vegetables than in 1970, 62 pounds more grain products, 54 pounds more fruits, 31 pounds more poultry, 10 gallons more milk lower in fat than whole milk, 20 pounds less red meat, 73 fewer eggs, and 17 gallons less whole milk (fig. 1). In 1994 (the latest year for which nutrient data are available), meat, poultry, and fish contributed nearly a third less saturated fat to the per capita food supply than in 1970, and beverage milk contributed a half less saturated fat. Similarly, eggs' contribution to total dietary cholesterol declined by a fourth between 1970 and 1994, and beverage milk's contribution declined by a half.

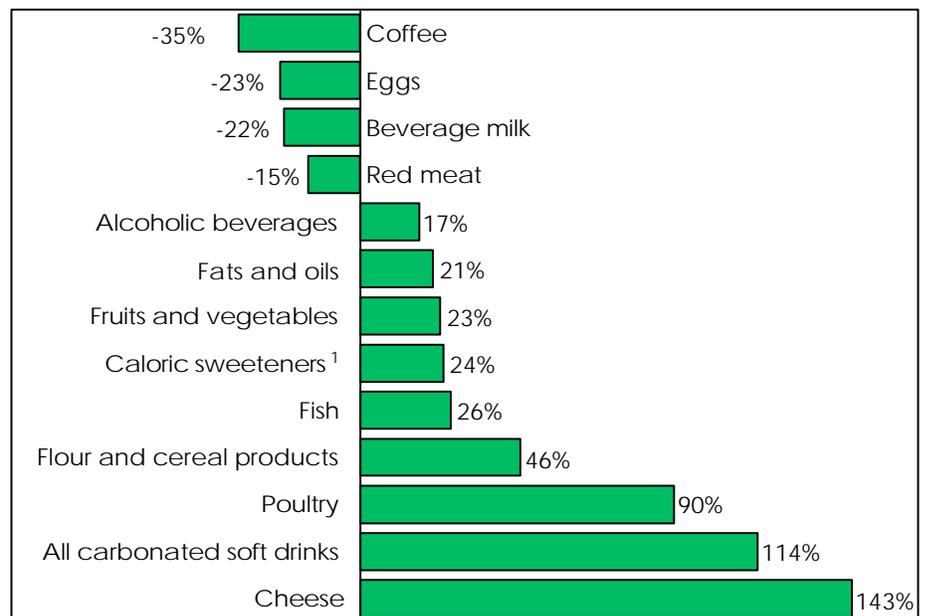
A variety of factors are responsible for the changes in U.S. consumption patterns in the last 25 years, including changes in consumer preferences, relative prices, increases in real (adjusted for inflation) disposable income, and more food assistance for the poor. New products, particularly more convenient ones, also contribute to shifts in consumption, along with more imports, growth in the away-from-home food

market, expanded advertising programs, and changes in food-enrichment standards and fortification policy. Sociodemographic trends also driving changes in food choices include smaller households, more two-earner households, more single-parent households, an aging population, and increased ethnic diversity. An expanded scientific base relating diet and health, new *Dietary Guidelines for Americans* designed to help people make food choices that pro-

mote health and prevent disease, improved nutrition labeling, and burgeoning consumer interest in nutrition also influence marketing and consumption trends.

Consistent with dietary and health recommendations, Americans now consume two-fifths more grain products and a fifth more fruits and vegetables per capita than they did in 1970, eat leaner meat, and drink lower fat milk. Many people have traded the typical high-fat eggs-and-

Figure 1
The U.S. Per Capita Food Supply Changed Markedly Between 1970 and 1996



Note: ¹Includes caloric sweeteners used in soft drinks.

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bacon breakfast of 1970 for more convenient ready-to-eat breakfast cereals, most of which are fortified with selected vitamins and minerals. Moreover, a steady increase in the proportion of refined flour that is enriched (from 65 percent in 1970 to more than 90 percent today), changes in flour-enrichment standards in 1974 and 1983, along with big increases in grain product consumption since 1984, have boosted per capita supplies of four nutrients lost in the milling process and approximately replaced by manufacturers—iron, niacin, thiamin, and riboflavin.

The typical supermarket fresh-produce department carries more than two-and-a-half times as many items today as in the mid-1970's. Increases in domestic production, rising imports, and improved storage facilities afford year-round availability of many fresh foods. Thanks to genetic research, today's carrots and squashes deliver twice as much beta carotene (a nutrient that the body converts to vitamin A) as they did in 1970 and today's grapes are much sweeter than years ago (and consumption has tripled since 1970).

But contrary to recommendations, Americans are consuming record-high amounts of caloric sweeteners and some high-fat dairy products, and near record amounts of added fats—including salad and cooking oils and baking and frying fats. Moreover, a hefty increase in grain consumption reflects higher consumption of mostly refined, rather than high-fiber, whole-grain products—less than 2 percent of the 148 pounds of wheat flour consumed per capita in 1996 was whole wheat flour. (Most nutrients lost during processing, including fiber, vitamins, minerals, and phytochemicals, are not restored to refined flour.) Potatoes used for fat-laden products like frozen french fries (eaten mostly

in fast-food eateries), potato chips, and shoestrings accounted for 11 percent of total U.S. per capita fruit and vegetable supplies (fresh-weight basis) in 1995, compared with 8 percent in 1970.

Evidence from various sources suggests that the average American now consumes more food, more snacks, bigger portions, and more calories than in 1970. A 15-percent increase during 1970-94 in the level of food energy (calories) in the U.S. per capita food supply reflects higher levels of all three energy-yielding nutrients: carbohydrates, fat, and protein. More calories, along with reductions in average physical activity (or energy expenditure), are behind an increase in obesity among adults, adolescents, and children in America. In fact, one-third of adults was overweight in the early 1990's, compared with one-quarter in the late 1970's.

USDA's Economic Research Service (ERS) and Center for Nutrition Policy and Promotion (CNPP) estimate per capita food and nutrient supplies, based on food disappearance data (see box). These data are used as a proxy to estimate human consumption, even though the data may overstate what is actually eaten because they represent food supplies available in the market and do not account for waste.

Per Capita Meat Supply Larger and Leaner

Now more than ever, we are a Nation of meat eaters—but we are eating leaner meat. In 1996, total meat consumption (red meat, poultry, and fish) amounted to 191 pounds (boneless, trimmed-weight equivalent) per person, 2 pounds below 1994's record high and 14 pounds above the 1970 level (table 1). Each American consumed an average of 20 pounds less red meat than in 1970, 31 pounds more poultry, and 3 pounds more fish and shellfish.

Nutritional concern about fat and cholesterol has encouraged the production of leaner animals, the closer trimming of outside fat on retail cuts of meat, and the marketing of a host of lower fat ground and processed meat products—significantly lowering the meat, poultry, and fish group's contribution to total fat and saturated fat in the food supply. Despite record-high per capita consumption of total meat in 1994, the proportion of fat in the U.S. food supply contributed by meat, poultry, and fish declined from 35 percent in 1970 to 25 percent in 1994. Similarly, the proportion of saturated fat contributed by meat, poultry, and fish fell from 37 percent in 1970 to 26 percent in 1994.

Red meat (beef, pork, lamb, and veal) accounted for 58 percent of the total meat supply in 1996, compared with 74 percent in 1970. By 1996, chicken and turkey accounted for 34 percent of the total meat consumed, up from 19 percent in 1970. Fish and shellfish accounted for 8 percent of total meat consumption in 1996 and 7 percent in 1970.

Prices explain much of the decline in per capita consumption of red meat, particularly beef. Retail prices for chicken have remained well below those for beef. In 1996, consumers paid an average of \$1.51 per pound for broilers, compared with \$2.80 a pound for beef, and \$2.21 for pork.

Prices do not entirely explain beef's market share loss to poultry. The poultry industry has enjoyed great success, partly by catering to consumers. Poultry has benefited from health-related concerns about beef. The industry has provided scores of new brand-name, value-added products processed for consumers' convenience—as well as a host of products for foodservice operators.

Consumer demand for more convenience—including eating out

Table 1

Americans Are Consuming More Grains, Vegetables, and Fruits Per Person

Item	Unit	1970	1975	1980	1985	1990	1995	1996
Total meat ¹	<i>pounds</i>	177.3	170.9	179.6	185.4	183.6	192.5	191.0
Beef	"	79.6	83.0	72.1	74.8	64.0	64.0	64.2
Chicken	"	27.4	26.4	32.7	36.4	42.5	48.8	49.8
Pork	"	48.0	38.7	52.1	47.7	46.4	49.0	46.0
Fish	"	11.7	12.1	12.4	15.0	15.0	14.9	14.7
Turkey	"	6.4	6.5	8.1	9.1	13.8	14.1	14.6
Eggs	<i>number</i>	309	276	271	255	234	235	236
Shell	"	276	245	236	217	186	174	174
Processed	"	33	31	35	38	48	61	62
Beverage milk ²	<i>gallons</i>	31.3	29.5	27.6	26.7	25.7	24.3	24.3
Plain	"	29.6	27.8	25.9	25.0	24.2	22.8	22.8
Whole	"	24.8	20.3	16.5	13.9	10.2	8.4	8.4
Reduced fat (2%)	"	3.2	4.7	6.3	7.9	9.1	8.2	8.0
Light (1% and 0.5%)	"	.2	1.5	1.8	1.7	2.3	2.5	2.6
Fat-free (skim)	"	1.3	1.3	1.3	1.5	2.6	3.7	3.9
Yogurt	<i>½ pint</i>	1.5	3.6	4.6	7.3	7.4	9.4	8.9
Fluid cream ³	"	9.8	10.0	10.5	13.5	14.3	15.8	16.4
Cheese ⁴	<i>pounds</i>	11.4	14.3	17.5	22.5	24.6	27.3	27.7
Frozen dairy desserts	"	28.5	28.6	26.4	27.9	28.4	29.4	28.7
Added fats and oils ⁵	"	52.6	52.6	57.2	64.3	62.8	66.8	64.9
Salad and cooking oils	"	15.4	17.9	21.2	23.6	24.8	26.8	26.0
Shortening	"	17.3	17.0	18.2	22.9	22.2	22.5	22.2
Table spreads	"	16.2	15.7	15.8	15.7	15.3	13.7	13.4
Lard and beef tallow	"	4.6	3.2	3.7	3.7	2.5	4.9	4.5
Fruits ^{6,7}	"	229	246	258	264	267	280	283
Fresh	"	101	102	105	111	116	125	129
Citrus	"	29	29	26	22	21	24	25
Noncitrus	"	72	73	79	89	95	100	104
Processing	"	128	144	153	153	151	155	154

Continued—

more often and using more prepared/processed foods at home—has brought substantial increases in the use of ground beef (which can be prepared quickly). Ground beef accounted for 42 percent of the beef (boneless, trimmed-weight equivalent) consumed in 1996, compared with 37 percent in 1985 and 28 percent in 1970. Purchases of roasts (which take longer to prepare) were down sharply. In 1996, about 40 percent of all U.S. beef was served through foodservice establishments, and three-quarters of these servings were hamburgers or cheeseburgers,

according to the American Meat Institute.

Supermarkets continue to make their retail beef cuts leaner, with less external fat. In 1985, most retail trim specifications called for a half-inch or more of outside fat on retail cuts of beef. By 1994, less than 1 percent of retailers had fat-trim specifications exceeding a quarter inch and 21 percent had eighth-inch-or-less-fat trim specifications.

Retailers also keep cutting fat from ground beef, which is required by Federal regulations to have at least 70 percent lean meat (no more than 30 percent fat by weight). The

amount of fat in ground and processed beef dropped from 28 percent to 22 percent between 1975 and 1987, with most of the decline occurring during 1986-87. This trend has continued. Several recent studies show that more than a fourth of all ground beef sold at retail is at least 86 percent lean and a tenth or more is at least 91 percent lean.

The average fat content of foodservice ground beef remains higher than that for retail ground beef, but has nonetheless declined over time as well. In 1997, the North American Meat Processors Association revised

Table 1

Americans Are Consuming More Grains, Vegetables, and Fruits Per Person—Continued

Item	Unit	1970	1975	1980	1985	1990	1995	1996
Vegetables ⁶	<i>pounds</i>	335	337	336	358	386	405	412
Fresh	"	153	147	149	156	166	176	179
Potatoes	"	62	53	51	46	46	51	49
Processing	"	182	190	187	202	220	228	234
Tomatoes for canning	"	62	62	64	63	75	76	74
Potatoes for freezing	"	28	37	35	45	50	55	60
Flour and cereals ⁸	"	136	139	145	156	182	192	198
Wheat flour	"	111	115	117	125	136	142	148
Corn products	"	11	11	13	17	22	23	23
Rice	"	7	8	9	9	16	20	19
Caloric sweeteners ⁹	"	122	118	123	129	137	150	152
Refined sugar	"	102	89	84	63	64	66	66
Corn sweeteners	"	19	27	38	65	71	83	84
High-fructose corn syrup (HFCS)	"	1	5	19	45	50	58	59
Carbonated soft drinks	<i>gallons</i>	24.3	28.2	35.1	35.7	46.3	51.6	51.9
Regular (nondiet)	"	22.2	25.0	29.9	28.7	35.6	39.8	40.2
Diet	"	2.1	3.2	5.1	7.1	10.7	11.8	11.7
Coffee	"	34	33	27	28	27	20	22
Bottled water	"	NA	NA	2.4	4.5	8.0	11.6	12.4
Beer ¹⁰	"	28.1	31.0	33.7	32.3	32.2	29.8	29.8
Fruit juice	"	6	6.6	7.2	7.7	7.3	8.7	8.7
Fruit drinks and ades	"	NA	NA	NA	NA	6.3	7.8	7.4

Notes: Data are per person per year. NA = Not available. Totals may not add due to rounding. ¹Boneless weight. Includes lamb, mutton, and veal. ²Includes flavored milk and buttermilk. ³Heavy cream, light cream, half and half, sour cream, and eggnog. ⁴Excludes full-skim American, cottage, pot, and baker's cheese. ⁵Total fat content. Individual items shown on a product-weight basis. ⁶Farm weight. ⁷Includes fruit juice. ⁸Includes oat, barley, and rye products. ⁹Dry weight. Includes honey, molasses, refiner's syrups, and caloric sweeteners added to commercially prepared foods and beverages. ¹⁰Per capita estimates use resident population ages 18 years and over.

and updated its 1988 *Meat Buyers Guide* to foodservice meat buyers and cut the upper limit for fat content of ground beef, unless otherwise specified, by 3 percentage points to 22 percent. (The purchaser may, however, specify a different fat content provided it does not exceed 30 percent.)

The next decade will undoubtedly bring more changes. Technological advances will mean a host of new products in the meat case. With little increase in overall consumption of meat products expected in the next decade, the beef, pork, poultry, and fish industries will try to capture a

larger share of a stagnant market by offering more prepared products.

Long-Term Decline in Egg Consumption Levels Off

Egg consumption has two components: shell eggs and egg products. Shell eggs are those eggs purchased in cartons in the grocery store. Egg products are eggs that have been processed and sold primarily to food manufacturers and foodservice operators in liquid or dried form. These pasteurized eggs reach consumers as ingredients in foodservice menu items and processed foods—such as pasta, candy, baked goods,

and cake mixes—or directly as liquid eggs in some grocery stores. These grocery store liquid egg products usually are made from egg whites and are used by consumers as a nonfat, no-cholesterol alternative to shell eggs.

Between 1970 and 1989, total annual consumption of shell eggs and egg products steadily declined about 4 eggs per person per year, from 309 eggs to 237. During the 1990's, total egg consumption has leveled off, fluctuating between 234 and 238 eggs per person per year. Per capita consumption was 236 eggs in 1996 and has been projected

to be 240 eggs in 1997. The record high for U.S. per capita consumption was 403 eggs in 1945.

A decline in per capita egg consumption over the last few decades reflects two very different and somewhat counterbalancing trends: a dominating, nearly constant decline

in consumption of shell eggs, and a partially offsetting growth in consumption of egg products during the 1980's and 1990's.

Shell-egg consumption dropped from 276 eggs per capita per year in 1970 to 174 in 1995 and 1996. The average annual rate of decline in per

capita shell-egg consumption was 4 eggs per year in the 1970's and 5 eggs per year in the 1980's. In the 1990's, the rate of decline in per capita consumption of shell eggs has slowed to 2-1/2 eggs per year and is expected to slow even more. 1996 saw a leveling off of the decline, as shell-egg consumption held steady at 174.

Much of the decline in shell-egg consumption since 1970 was due to changing lifestyles (for example, less time for breakfast preparation in the morning as large numbers of women joined the paid labor force) and the perceived ill effects of cholesterol intake associated with egg consumption. Total cholesterol in the U.S. per capita food supply declined 13 percent between 1970 and 1994, from 470 milligrams per person per day to 410 milligrams (table 2). Eggs contributed 39 percent of the total cholesterol in the food supply in 1970 and 34 percent in 1994.

Declining wholesale and retail egg prices may have spurred egg use in recent years. The average retail price for a dozen large, Grade A eggs declined from \$1.01 in 1990 to \$.86 in 1994. Changing consumer attitudes toward eggs may also be responsible. New test results show eggs to contain less cholesterol than previously documented, leading the American Heart Association to increase its maximum recommended consumption from three eggs per week to four.

Consumption of egg products has grown consistently since 1983, reaching the equivalent of 62 eggs per person by 1996. The growth period followed more than two decades of relatively constant consumption, remaining between the equivalent of 28 and 36 eggs per person from 1960 to 1983. Egg product consumption will continue to increase as consumers opt for more prepared foods and as any perception of potentially negative dietary attributes of processed eggs is lessened.

Table 2

The Per Capita Food Supply Provides Insufficient Levels of Calcium and Folate¹

Nutrient	Unit	1970	1994	Percent change
Food energy	calories	3,300	3,800	15
Carbohydrates	grams	386	491	27
Protein	"	95	110	16
Total fat	"	154	159	3
Saturated fatty acids	"	54	52	-4
Monounsaturated fatty acids	"	63	65	2
Polyunsaturated fatty acids	"	26	31	19
Cholesterol	milligrams	470	410	-13
Vitamin A	micrograms retinol equivalent	1,500	1,520	1
Carotenes	"	510	660	29
Vitamin E	milligrams alpha-tocopherol equivalent	13.7	16.9	23
Vitamin C	milligrams	107	124	16
Thiamin	"	2.0	2.7	35
Riboflavin	"	2.3	2.6	13
Niacin	"	22	29	32
Vitamin B-6	"	2.0	2.3	15
Folate	micrograms	279	331	19
Vitamin B-12	"	9.5	8.1	-15
Calcium	milligrams	890	960	8
Phosphorus	"	1,460	1,680	15
Magnesium	"	320	380	16
Iron	"	15.4	21.2	38
Zinc	"	12.2	13.2	1
Copper	"	1.6	1.9	19
Potassium	"	3,510	3,780	8

Notes: ¹The level of calcium in the 1994 food supply was insufficient to meet the 1997 Dietary Reference Intake (DRI) values for calcium, which would require a population-weighted-average of 1,040 milligrams (not counting losses or waste) per person in 1994. The level of folate in the 1994 food supply was insufficient to support the Public Health Service's 1992 recommendation that all women of childbearing age consume 400 micrograms of folate, or folic acid, a day. However, implementation by January 1, 1998, of a new FDA folate-fortification policy for all enriched grain foods should provide ample folate in the 1998 food supply.

Higher Use of Cheese Foils Efforts To Cut Average Milkfat Consumption

In 1996, Americans drank an average of 22 percent less milk and ate nearly 2-1/2 times as much cheese (excluding cottage types) as in 1970. Annual per capita consumption of milkfat from fluid milk products (beverage milk and yogurt) has declined by half since 1970 due to lower beverage milk consumption and a trend toward lower fat milks. Americans cut their average consumption of fluid whole milk by two-thirds between 1970 and 1996, and nearly tripled their use of lower fat milks. But because of the growing yen for cheese and fluid cream products, the Nation failed to cut the overall use of milkfat. (Annual average consumption of milkfat from some other dairy products—butter, frozen dairy products, condensed milk, evaporated milk, dry milk, and cottage-type cheeses—also declined between 1970 and 1996 due to lower consumption of these products and increasing preference for lower fat versions.)

Annual per capita consumption of fluid milk declined from 31 gallons in 1970 to 24 gallons in 1996. Consumption of carbonated soft drinks, fruit drinks and ades, and flavored teas may be displacing beverage milk in the diet. Big increases in eating away from home, especially at fast-food places, and in consumption of salty snack foods favored soft drink consumption.

The beverage milk trend is toward lower fat milk. While whole milk represented 81 percent of all beverage milk (plain, flavored, and buttermilk) in 1970, its share dropped to 36 percent in 1996. Yet, whole milk continues to rank number one in popularity. In 1996, plain whole milk accounted for 37 percent of all

plain beverage milk, 2-percent reduced fat milk for 35 percent, and light (0.5-percent and 1-percent) and fat-free (skim) milks combined for 28 percent. In terms of average consumption, light and fat-free milks increased 25 percent in 1991-96, 2-percent milk declined 12 percent, and whole milk declined 15 percent.

Total beverage milk contributed 50 percent less fat to the average American's diet in 1996 than in 1970. In contrast, rising consumption of fluid cream products meant that they contributed nearly two times as much milkfat to the average diet in 1996 as in 1970. (Per capita consumption of fluid cream products—half-and-half, light cream, heavy cream, eggnog, sour cream, and dips—jumped from 9.8 half pints in 1970 to 16.4 half pints in 1996.)

On balance, however, annual per capita consumption of milkfat from all fluid milk and cream products declined by 36 percent in 1970-96, from 9.1 pounds per person to 5.8 pounds. Of that 5.8 pounds, whole milk contributed 2.4 pounds; lower fat milks, 1.8 pounds; and fluid cream products, 1.5 pounds. Skim milk added 0.05 pound of fat to the average diet in 1996, and yogurt (most of which is reduced fat or fat-free) added 0.09 pound of fat.

These changes are consistent with increased public concern about consuming cholesterol and animal fats. However, the decline in per capita consumption of fluid milk between 1970 and 1996 also may be attributed to declining numbers of U.S. teenage males and children ages 5-12 years, an increasing incidence of lactose intolerance among Americans due to the growing ethnic diversity and aging of the population, and increasing preference for soft drinks, including diet soft drinks.

Price is also behind the shift to lower fat milks. Skim milk traditionally has been cheaper than whole milk. This has not always been the case for 1-percent and 2-percent

milks. However, since 1980, the retail prices for a half gallon of 1-percent and 2-percent milks have averaged a few cents below that for whole milk.

Over time, this has eased the way for consumers to accept and prefer the lower fat milk. Evidence of such acceptance is McDonald's switch from whole milk to 2-percent in 1986 and from 2-percent milk to 1-percent in 1991. Starbucks and other coffee chains and foodservice operators now provide whole milk and fat-free milk in addition to half-and-half, cream, and coffee whiteners.

Advertising has influenced the shift to lower fat milks. A major print advertising program that features celebrities, models, and sports stars wearing "milk mustaches" has improved the overall image of milk, especially light and skim milks. Preliminary research indicated that major contributing factors to a decline in total milk consumption were concern about fat and a belief that lower fat milks contain fewer nutrients than whole milk. Follow-up research showed that more people now know that lower fat milks are as high or higher in calcium, vitamins, and nutrients (except fat) as whole milk.

A sixfold increase in per capita consumption of yogurt since 1970—to 9 half-pint servings per person in 1996—partially offset the decline in beverage milks.

Average consumption of cheese (excluding full-skim American and cottage, pot, and baker's cheeses) increased 140 percent between 1970 and 1996, from 11 pounds per person to 28 pounds. Lifestyles that emphasize convenience foods were probably major forces behind the higher consumption. In fact, two-thirds of our cheese now comes in commercially manufactured and prepared foods (including foodservice), such as pizza, tacos, nachos, salad bars, fast-food sandwiches, bagel spreads, sauces for baked

potatoes and other vegetables, and packaged snack foods. Advertising and new products—such as reduced-fat cheeses and resealable bags of shredded cheeses, including cheese blends tailored for use in Italian and Mexican recipes—also had an effect.

From 1970 to 1996, consumption of Cheddar cheese, America's favorite cheese, increased 59 percent to 9.2 pounds per capita. Consumption of Italian cheeses more than quintupled during the same period, to 10.8 pounds per person in 1996. For example, per capita con-

sumption of mozzarella—the main pizza cheese—in 1996 was 8.5 pounds, more than 7 times higher than in 1970, making it America's second-favorite cheese. Cream cheese (including Neufchatel) overtook Swiss in the 1980's to become America's third favorite cheese, at 2.2 pounds consumed per person in 1996. Annual per capita consumption of total cottage cheese declined by half during 1970-96, to 2.6 pounds. The decline was in whole-milk cottage cheese; consumption of lower fat cottage cheese quadrupled during the same period to 1.2 pounds per person in 1996. Despite a flurry of lower fat cheese introductions in the 1990's, these products still accounted for about a fifth of supermarket cheese sales for the 52 weeks ending July 12, 1997 (at 21 percent, that is down 1 percentage point from a year earlier), according to the International Dairy Foods Association. Lower fat cheeses make up a much smaller proportion of the total cheese used by food manufacturers and foodservice operators.

How Food Consumption Is Measured

USDA's Economic Research Service annually calculates the amount of food available for consumption in the United States. The U.S. food supply series measures national consumption of several hundred basic commodities. It is the only continuous source of data on food and nutrient availability in the country.

The food supply series is based on records of commodity flows from production to end uses. Therefore, the total available supply is the sum of production, beginning inventories, and imports. These three components are either directly measurable or are estimated by Government agencies using sampling and statistical methods.

The food available for human use reflects what is left from available supply after deducting exports, industrial uses, farm inputs, and end-of-year inventories. Human food use is not directly measured or statistically estimated. Instead, it is a residual component after subtracting out other uses from the available total supply.

The availability of food for human use represents disappearance of food into the marketing system, and it is often referred to as food disappearance. Food disappearance measures food supplies for consumption through all outlets—at home and away from home. Per capita food use, or consumption, is calculated by dividing the total annual food disappearance by the total U.S. population.

Food disappearance is often used as a proxy to estimate human consumption. Used this way, the data

usually provide an upper bound on the amount of food available for consumption. In general, food disappearance data indicate trends in consumption over time rather than absolute levels of food eaten. Food disappearance estimates can overstate actual consumption because they include amounts that may be discarded during processing or marketing, lost in spoilage, or thrown away at home. For example, the food estimates may overstate fats and oils, since large amounts are used for frying by fast food restaurants and are later discarded.

USDA's Center for Nutrition Policy and Promotion uses data on the amount of food available for consumption and information on the nutrient composition of foods from USDA's Agricultural Research Service to calculate the nutrients available in the food supply. As with the food supply estimates, the resulting nutrient estimates do not account for losses during processing, marketing, or home use. For example, vegetables generally lose nutrients, particularly water-soluble ones like vitamin C and thiamin, when cooked in water.

Nutrients not included in these values are those from vitamin and mineral supplements, alcoholic beverages (or the grains and sugar used to make alcoholic beverages), baking powder, yeast, and certain vitamins and minerals used for functional or flavoring agents in foods. Nutrients added through enrichment of flour and cereal products and through fortification of other foods are included in the nutrient values.

Use of Added Fats Began To Decline, But Remains Near Record-High Level

Americans' overriding nutrition concern in the mid-1990's with cutting dietary fat is apparent in the recent per capita food supply data, which shows a modest decline since 1993 in the use of added fats and oils. However, average use of added fats and oils in 1996 remained more than a fifth above the 1970 level. Added fats and oils include fats and oils used directly by consumers, such as butter on bread, as well as shortenings and oils used in commercially prepared cookies, pastries, and fried foods. Excluded is all fat naturally present in foods, such as in milk and meat.

Annual per capita consumption of added fats and oils declined at least 8 percent between 1993 and 1996,

from a record-high 70 pounds (fat-content basis) per person to 65 pounds. This 8-percent decrease reflects the following declines in per capita use (product-weight basis): 9 percent for butter, 18 percent for margarine and spreads, 12 percent for shortening, 10 percent for salad and cooking oils, and 18 percent for specialty fats used mainly in confectionery products and nondairy creamers. The only increase in per capita consumption among added fats during 1993-96 was for lard (up 35 percent). Lard and edible beef tallow are used mainly for baking and frying in the commercially prepared foods and foodservice sectors; supermarket sales of lard, which accounted for only 6 percent of total lard consumption in 1996, have declined since 1993. Per capita consumption of edible beef tallow in 1996 was the same as in 1993—2.2 pounds per person.

The decline in annual per capita consumption of added fats and oils between 1993 and 1996 will be slightly higher than 8 percent when ERS adjusts the data to reflect the trend toward lower fat margarine-type spreads. The food supply database currently puts the fat content of all margarine and spreads at 80 percent, based on the standards of identity for margarine and butter. However, ERS research estimates the average fat content for margarine and spreads at just under 65 percent in 1996, down significantly from 1993.

In 1970, the fats and oils group (composed of all added fats and oils) contributed the most fat to the food supply (43 percent), followed by the meat, poultry, and fish group (35 percent). By 1994, the fats and oils group's contribution to total fat had jumped 9 percentage points to 52 percent, probably due to the greatly expanded consumption of fried foods in foodservice outlets, the huge increase in consumption of

high-fat snack foods, and the increased use of salad dressings. (The average woman aged 19 to 50 gets more fat from salad dressing than from any other food, according to recent USDA food intake surveys.)

In contrast, by 1994, the meat, poultry, and fish group's contribution to total fat had dropped 10 percentage points to 25 percent, reflecting changes in fat-trimming practices at processor and retail levels, improvements in animal husbandry, and increasing substitution of poultry and fish for red meats. Dairy products' contribution to total fat declined from 12.6 to 12.3 percent between 1970 and 1994, even as total fat from dairy products increased from 19 to 20 grams per person per day. A decline in fat accompanying a decline in beverage milk consumption and a shift from whole milk to lower fat milks was offset by an increase in fat associated with big hikes in cheese and cream products use.

Average Consumption of Fruits and Vegetables Rises

As Americans increasingly embrace national health authorities' recommendation of consuming five fruits and vegetables a day, their array of choices continues to widen. Fresh-cut fruits and vegetables, prepackaged salads, locally grown items, and exotic produce—as well as hundreds of new varieties and processed products—have been introduced or expanded in the last decade.

Supermarket produce departments carry over 400 produce items today, up from 250 in the late 1980's and 150 in the mid-1970's. Also, the number of ethnic, gourmet, and natural foodstores—which highlight fresh produce—continues to rise.

Consumers increasingly have more access to fresh local produce as well. The number of farmers' markets reported to State agriculture

departments has grown substantially throughout the United States over the last several decades, numbering around 1,755 in the end of 1993 and eclipsing 2,400 in mid-1996. Some analysts say that the total number of farmers' markets, including those not reported, is more than double that figure.

While the overall market for fruits and vegetables has expanded in the last 15 years, the mix has changed. Shifts have taken place among traditional produce items and between fresh and processed forms. Traditional varieties have lost market share to specialty varieties, and exotic produce has gained favor. For example, per capita consumption of iceberg lettuce fell by 5.4 pounds (or 19 percent) between 1989 and 1996, while per capita consumption of romaine and leaf lettuces increased 2.8 pounds (or 78 percent) during the same period. In addition, many specialty lettuces not yet tracked in USDA's food supply database—such as radicchio, frisée, arugula, and red oak—gained in popularity in the last several years because of inclusion in fresh-cut salad mixes and in upscale restaurant menus.

Total per capita use of 80 commercially produced fruits and vegetables (for which ERS has U.S. production data) rose 23 percent, from 564 pounds in 1970 to 696 pounds in 1996. Four-fifths of this increase occurred since 1982, the year in which an expert scientific panel convened by the U.S. National Academy of Sciences published its landmark report *Diet, Nutrition, and Cancer*. The report emphasized the importance of including fruits (especially citrus fruits), vegetables (especially carotene-rich and cruciferous, or cabbage family, vegetables), and whole-grain cereal products in the daily diet, noting that these dietary guidelines were consistent with good nutritional practices and likely to reduce the risk of cancer.

The rate of increase in per capita consumption of processed fruits and vegetables, including potatoes, between 1970 and 1996 outpaced that for fresh produce—24 percent versus 21 percent. The trend is reversed and more pronounced, however, if potatoes are excluded. In that case, the rise in per capita use of processed fruits and vegetables other than potatoes during the same period was only 18 percent, compared with a 34-percent rise for fresh items. These divergent trends reflect two important points. Potatoes constitute a significant portion of total estimated fruit and vegetable consumption—21 percent in 1996, down from 22 percent in 1970. Second, in contrast to a pronounced trend toward fresh produce for most fruits and vegetables, Americans are increasingly choosing fat-laden french fries (bought mainly at fast-food eateries) and eschewing nutrient-dense fresh potatoes.

Grain Consumption Up From 1970's, But Far Below Early 1900's Highs

Per capita use of flour and cereal products reached 198 pounds in 1996 from an annual average of 145 pounds in 1980 and 136 pounds in 1970 (table 1). The expansion in supplies reflects ample grain stocks, strong consumer demand for variety breads and other instore bakery items, and increasing fast-food sales of products made with buns, doughs, and tortillas. The increase is far below the 300 pounds consumed per person in 1909 (the earliest year for which data are available).

USDA's nationwide food consumption surveys confirm the food supply data, also indicating Americans are eating more grain products. Consumption of grain mixtures—such as lasagna and pizza—increased 115 percent

between 1977 and 1994. Snack foods—such as crackers, popcorn, pretzels, and corn chips—soared 200 percent, and ready-to-eat cereals were up 60 percent. One of the biggest changes within the grain mixture group was the explosion in consumption of ethnic foods, especially Mexican foods. Mexican foods were consumed four times more often in 1994 than in the late 1970's.

Yet Americans are still eating a serving or less a day of whole grain foods, far below the minimum three per day the American Dietetic Association (ADA) recommends. If a bread does not have whole wheat, oats, or some other whole grain as the first ingredient, much of its vitamin- and mineral-rich germ and bran have been milled away, along with most of its fiber. Enriched flour, from which most breads are made, is not a whole grain. The processor has added back three of the B vitamins and the iron that were lost when the flour was refined. Some companies that make "light" breads also add highly processed fiber to boost the fiber content and cut the calories. But nothing replaces the lost vitamin E, B-6, magnesium, manganese, zinc, potassium, copper, pantothenic acid, and phytochemicals.

Beginning January 1, 1998, all enriched grain foods, including pasta, bread, rolls, flour, cakes, and cookies will be fortified with folate (the B-vitamin folic acid), which is also lost during milling. That should reduce the risk of neural tube birth defects like spina bifida. It may also protect adults from heart disease and reduce the chances of cervical cancer in women. Folic acid is found naturally in legumes; liver; many vegetables, especially green leafy ones like spinach; citrus fruits and juices; whole-grain products; and eggs.

Most ready-to-eat breakfast cereals are fortified with folate. Fortified ready-to-eat cereals usually contain at least 25 percent of the U.S. Rec-

ommended Daily Allowance (RDA) for folate (since cereals vary, check the label on the package for the percentage of the U.S. RDA).

Average Consumption of Caloric Sweeteners Hits Record High

Americans have become conspicuous consumers of sugar and sweet-tasting foods and beverages. Per capita consumption of caloric sweeteners (dry-weight basis)—mainly sucrose (table sugar made from cane and beets) and corn sweeteners (notably high-fructose corn syrup, or HFCS)—increased 32 pounds, or 27 percent, between 1982 and 1996. In 1996, each American consumed a record average 152 pounds of caloric sweeteners. That amounted to more than two-fifths of a pound—or 47 teaspoonfuls—of added sugars per person per day in 1996. USDA's Food Guide suggests that people on a 1,600-calorie diet limit their intake of added sugars to 6 teaspoons per day. The daily suggested limit increases to 12 teaspoons for those consuming 2,200 calories a day, and to 18 teaspoons for those consuming 2,800 calories.

A striking change in the availability of specific types of sugar occurred in the past two decades. Sucrose's share of total caloric sweetener use dropped from 83 percent in 1970 to 44 percent in 1996, while corn sweeteners increased from 16 percent to 55 percent. All other caloric sweeteners—including honey, maple syrup, and molasses—combined to maintain a 1-percent share.

In 1996, Americans consumed 73 percent more caloric sweeteners per capita than in 1909. In 1909, two-thirds of the sugar produced went directly into the home, which meant control was in the hands of the person who bought it. The balance was used mostly by industry. In contrast,

more than three-quarters of the refined and processed sugars produced today goes to food and beverage industries, and less than a quarter is being brought home.

Sugar—including sucrose, corn sweeteners, honey, and molasses—is, in a sense, the number-one food additive. It turns up in some unlikely places, such as pizza, bread, hot dogs, boxed rice mixes, soup, crackers, spaghetti sauce, lunch meat, canned vegetables, fruit drinks, flavored yogurt, ketchup, salad dressing, mayonnaise, and some peanut butter.

The steep rise in caloric sweetener consumption since the mid-1980's coincides with a 43-percent increase in annual per capita consumption of regular (nondiet) carbonated soft drinks, from 28 gallons per person in 1986 to 40 gallons in 1996 (that is 14.1 ounces per person per day, an amount that contains nearly 11 teaspoonfuls of sugar). Carbonated soft drinks provided more than a fifth (22 percent) of the refined and processed sugars in the 1994 American diet.

Availability of Calories and Most Nutrients Also Increased

The U.S. per capita food supply contained more calories in 1994 than in 1970, due to higher levels of carbohydrates, protein, and fat (table 2). Despite the higher level of fat, saturated fatty acids decreased due to the increased availability of leaner red meat and the substitution of poultry and fish for red meat. Cholesterol also declined during 1970-94, due largely to a 23-percent decline in egg consumption and, to a lesser extent, a drop in consumption of organ meats, such as liver, and a switch to lower fat dairy products. Per capita levels of most vitamins and all minerals increased from 1970 to 1994.

The level of food energy available in the food supply increased from 3,300 calories per person in 1970 to 3,800 in 1994. This 15-percent increase reflects higher levels of all three energy-yielding nutrients: carbohydrates, fat, and protein. The proportion of calories from carbohydrates increased from 47 to 51 percent, while the share from fat decreased from 42 to 38 percent. Protein has consistently accounted for about 11 percent of calories.

Vitamins are organic substances essential in small amounts for adequate health, growth, reproduction, and maintenance. B-12 is the only vitamin whose per capita level dropped between 1970 and 1994. The 15-percent decrease was due to lower consumption of organ meats, notably liver, and egg yolks. While the 1994 value for vitamin B-12 was lower than earlier levels, it still exceeded the recommended allowances for a healthful diet by a generous margin.

The levels of vitamins A and C were higher in 1994 than in 1970 due to increased availability of vegetables and fruits. While the increase in vitamin A is slight (1 percent), a shift in vitamin sources occurred between 1970 and 1994 from organ meats and egg yolks to dark-green and deep-yellow vegetables. This shift increased vitamin A contributions from these vegetables from 20 to 28 percent between 1970 and 1994. The level of carotene increased by 29 percent because of the development of new varieties of deep-yellow vegetables, notably carrots and squashes, that contain more carotene than previous varieties.

Historically, the nutrient levels in the food supply were deemed to provide sufficient food energy, macronutrients, and micronutrients to meet the nutritional needs of most Americans. In fact, nutrient levels in the food supply need to exceed recommended allowances for a healthy diet, because estimates are for the amount available before

adjusting for trimming, cooking, and other losses. In addition, per capita values are averages for the population and do not account for the higher nutritional needs of some people.

However, a significant expansion of the research base and an increased understanding of nutrient requirements and food constituents in the 1990's have prompted increases in recommended intakes for some nutrients—notably calcium and folate—to levels greater than those provided in the 1994 per capita food supply. The RDA's, first developed by the Food and Nutrition Board in 1941 and periodically updated, are being replaced by new recommendations, called Dietary Reference Intakes (DRI's). The DRI's also are being developed by the Food and Nutrition Board, which is now part of the Institute of Medicine (IOM), National Academy of Sciences. Unlike the RDA's, which were initially established to protect against diseases like rickets caused by nutrient deficiencies, the DRI's aim to optimize health by also minimizing the risk of major chronic diseases, such as osteoporosis. The first in a series of IOM reports on DRI's, published in 1997, reviews five bone-related nutrients: calcium, phosphorus, magnesium, vitamin D, and fluoride.

Adequate intake of folate—one answer to having healthier babies and a healthier heart—is a public health concern; folate is currently under review by the IOM. The 1994 food supply provided 331 micrograms of folate per person per day, an amount that exceeds the 1989 RDA's for all individuals except pregnant women. Since 1989, however, strong scientific research has shown that folate, or folic acid, reduces the risk of neural tube birth defects such as spina bifida, when consumed in adequate amounts by women before and during early

pregnancy. Mounting scientific evidence also suggests that folate may reduce the risk of heart disease by lowering levels of homocysteine in the blood. The U.S. Public Health Service recommended in 1992 that all women of childbearing age consume 400 micrograms of folic acid daily. Current folate levels in the per capita food supply fall short of this recommendation. However, with implementation by January 1, 1998, of a new FDA folate-fortification policy for all enriched grain foods, the 1998 food supply should provide enough folate to meet the needs of women of childbearing age and others as defined by FDA and the upcoming IOM recommendations.

The new IOM recommendations for vitamin D are twice as high for adults ages 51 through 70 years and three times higher for adults above 70 years than for younger people or previous recommendations. The amount of vitamin D in the food supply is not estimated because data on the vitamin D content of foods are provisional and limited to selected foods. Since the main dietary source of vitamin D is fortified milk products for which consumption is low, food supply levels

of vitamin D are likely insufficient to meet the new recommendations for the U.S. population for vitamin D.

Calcium intakes recommended by the IOM are increased to at least 1,000 milligrams a day (about the amount in three servings of milk or other dairy foods) for all Americans over 8 years of age. Even higher calcium intakes are recommended for adults over 50 years (1,200 milligrams per day, or about 4 servings) and for teens 9 through 18 years (1,300 milligrams per day, about 4 servings). The 1994 per capita food supply provided an average 960 milligrams of calcium per person per day; the new IOM recommendations would have required a population-weighted-average 1,040 milligrams (not counting waste or losses) per person per day in 1994. However, ERS estimates the amount of loss for dairy products—the main source of calcium (73 percent) in the 1994 U.S. diet—including spilled milk, discarded moldy cheese, and the like—at a third of the available supply, indicating that current dietary calcium supplies are well below those needed to meet the new IOM recommendations. As the IOM establishes DRI's for other nutrients, other nutrient shortfalls in the food supply may become apparent.

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Imports Play a Growing Role in the American Diet

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Although food imports account for a relatively small share of the total U.S. diet, they play an important and growing role. Imports accounted for 13 percent of the fresh fruit (excluding bananas), 8 percent of the fresh vegetables, 7 percent of the red meat, and more than one half of the fresh, frozen, and processed fish and shellfish available for consumption in the U.S. food supply during 1991-95. Imports have increased as a share of consumption for many major foods over the past 10 years, with some of the largest percentage gains in frozen vegetables (1.8 to 7.2 percent), fresh melons (8.8 to 13.9 percent), other fresh noncitrus fruit, excluding bananas (9.0 to 15.9 percent), and rice (2.4 to 9.2 percent) (table 1).

Imports have long played an important role in the American diet by providing fresh fruits and vegetables year-round and by helping to hold down retail prices when domestic supplies fall short due to severe weather or other disruptions in U.S. production. For example, following the almost total destruction

of U.S. lime trees by Hurricane Andrew in 1992, a surge in lime imports from Mexico helped maintain domestic supplies and kept retail lime prices from otherwise sharply increasing.

Imports also provide American consumers with such dietary mainstays as coffee, tea, bananas, spices and herbs, and cocoa products, since U.S. production of these commodities is limited by climatic and other factors. The United States imported an average of 13.3 billion pounds of these and other tropical products each year during 1991-95, accounting for nearly 100 percent of total domestic use of these foods.

For many consumers, however, those products represent only a fraction of the wide variety of imported fresh fruits, vegetables, meats, cheeses, and processed food products that they have come to expect in their local supermarket. Increased consumption of imported foods is driven by many of the same factors underlying other changes in the American diet—rising household incomes, growth in the away-from-home food market, increased ethnic diversity of the population, and growing interest in diet and health. For example, the health benefits attributed to “Mediterranean” diets high in olive oil have likely been a major force behind the 227-percent

increase in olive oil imports over the past 10 years.

U.S. participation in global and regional trade agreements, such as the North American Free Trade Agreement (NAFTA) and the Uruguay Round Agreement of the General Agreement on Tariffs and Trade (GATT), also has increased the availability and affordability of imported foods through reduced trade barriers.

A strong U.S. dollar relative to other currencies has also contributed to the upswing in imports by making foreign foods more affordable in the United States. In the case of Mexico, a strong U.S. dollar coupled with the devaluation of the peso and Mexican recession in 1994 and 1995 (which reduced domestic demand for fresh produce) made fresh fruits and vegetables from Mexico less expensive for U.S. consumers, boosting U.S. consumption of imports. For example, U.S. imports of six fresh vegetables—tomatoes, bell peppers, cucumbers, squash, eggplant, and snap beans—rose by more than half from 1.8 billion pounds in 1994 to 2.9 billion pounds in 1996.

Adoption of new production technology, marketing infrastructure, and other technological improvements by exporting countries have enabled foreign products to meet the

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Table 1

Imports' Share of Consumption Grows for Many Foods

Selected commodities	Import quantity		Imports' share of total consumption	
	1991-95	1981-85	1991-95	1981-85
	<i>Million pounds</i>		<i>Percent</i>	
Vegetables:				
Fresh	3,468	2,288	7.8	6.5
Processing ¹	2,520	1,668	5.3	4.6
Canning	1,083	1,415	4.0	6.4
Freezing	1,438	253	7.2	1.8
Fresh fruit:				
Melons	915	453	13.9	8.8
Citrus	351	108	5.8	2.0
Bananas	6,938	5,196	99.8	99.9
Other noncitrus ²	2,966	1,335	15.9	9.0
Grains:				
Wheat flour	6,739	1,673	1.8	.6
Wheat	76	8	8.9	1.2
Rice	6	1	9.2	2.4
Pulses:				
Dry beans	74	57	3.8	4.1
Dry peas and lentils	29	17	21.9	16.7
Peanuts	47	2	2.4	.1
Dairy:				
American cheese	19	21	.7	.8
Other cheese	295	262	7.7	12.3
Total cheese	314	283	4.6	5.9
Meat, poultry, fish:				
Total red meat ³	3,109	2,744	7.3	6.7
Beef	2,344	1,910	9.6	7.7
Pork	713	788	4.1	5.1
Lamb	51	25	14.0	6.6
Poultry	0	0	0	0
Fish and seafood	2,151	1,613	56.0	50.9
Fresh and frozen	1,649	1,264	64.1	63.3
Canned	432	283	36.3	25.6
Cured	69	66	87.6	95.0
Edible fats and oils: ⁴				
Olive	255	78	100.0	100.0
Canola ⁵	908	NA	87.5	NA
Tropical oils ⁶	1,582	1,566	100.0	100.0
Sugar and sweeteners: ⁷				
Cane and beet sugar	1,629	3,009	18.3	33.9
Corn sweeteners	152	81	2.2	1.8
Other	20	6	1.8	1.3
Selected tropical products:				
Coffee	2,439	2,400	99.9	99.9
Cocoa	1,523	999	100.0	100.0
Spices and herbs	587	394	90.1	84.2
Tea	248	181	100.0	100.0

Notes: NA = Not applicable. ¹Farm-weight equivalent, excludes canned and frozen legumes. ²Excludes bananas and melons. ³Carcass-weight equivalent. ⁴Includes some industrial uses of edible fats and oils. ⁵Canola oil was not approved for human use by the U.S. Food and Drug Administration until 1985. ⁶Palm oil, palm kernel oil, coconut oil. ⁷Dry-weight basis. Source: USDA's Economic Research Service.

quality and safety standards of American consumers and also boosted the comparative advantage of imported foods in the U.S. marketplace. For example, Mexico's adoption of less perishable Extended Shelf Life (ESL) varieties, along with yield-enhancing production technology, have given tomatoes from Mexico an advantage in the U.S. fresh tomato market during the 3-month peak import period. The bright-red color and firmness of vine-ripened ESL varieties are viewed more favorably by U.S. consumers than the mature green type grown in Florida, the main U.S. producer of fresh-market tomatoes. ESL varieties do not grow well in Florida because heavy rains common during the growing season cause the tomatoes to crack on the vine, making them unmarketable in their fresh form.

Off-Season Trade Drives Fruit and Vegetable Imports

Fresh fruit and vegetable imports are concentrated in the U.S. off-season, thereby providing year-round availability and affordability. Seasonally adjusted tariff-rate quotas help protect many domestic fruit and vegetable producers from import competition during the U.S. growing season. But during the U.S. off-season (which depending on the commodity runs from September to early March), imports account for a significant share of total available supplies (fig.1).

Increased imports of some fresh noncitrus fruit has nearly doubled the imported share of total fresh fruit consumption from 7 to 13 percent (excluding bananas) since 1986. The increase can be attributed mainly to a surge in imports of peaches, pears, plums, and table grapes from Chile, the largest winter

fruit supplier to the United States. Chile has maintained a steady share of the U.S. fruit market since the mid-1980's, when economic reforms and trade liberalization substantially increased Chile's export capacity (fig. 2).

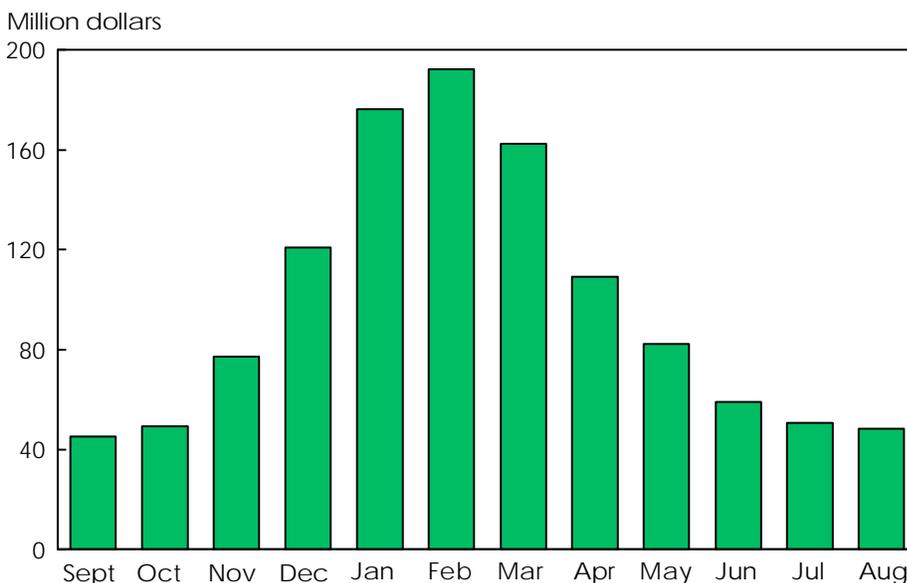
The imported share of processed vegetables has also grown over the past 10 years—albeit more modestly than the growth in fresh products—from 4.6 to 5.3 percent of total U.S. supplies. A nearly six-fold increase in frozen vegetable imports, led by frozen french fries from Canada and frozen broccoli from Mexico, was largely behind the growth in processed vegetable imports. Increased imports of frozen products offset a steady decline in canned tomato imports, resulting in a small net increase in processed vegetable imports. Imports dropped from 7.5 percent of canned tomato consumption in 1981-85 to 3.5 percent in 1991-95, as U.S. processing capacity expanded in response to soaring consumer demand for pizza, salsa, and tomato-based pasta sauces.

The United States also imports significant quantities of processed fruits, including prepared and preserved pineapples, oranges, banana pulp, jams, and fruit juices. For example, 55 percent of the apple juice (single-strength equivalent) in the U.S. market is imported (mostly in the form of frozen concentrates from Germany), as is 22 percent of orange juice (mostly frozen concentrates from Brazil).

Seafood Imports Large Compared to Meat

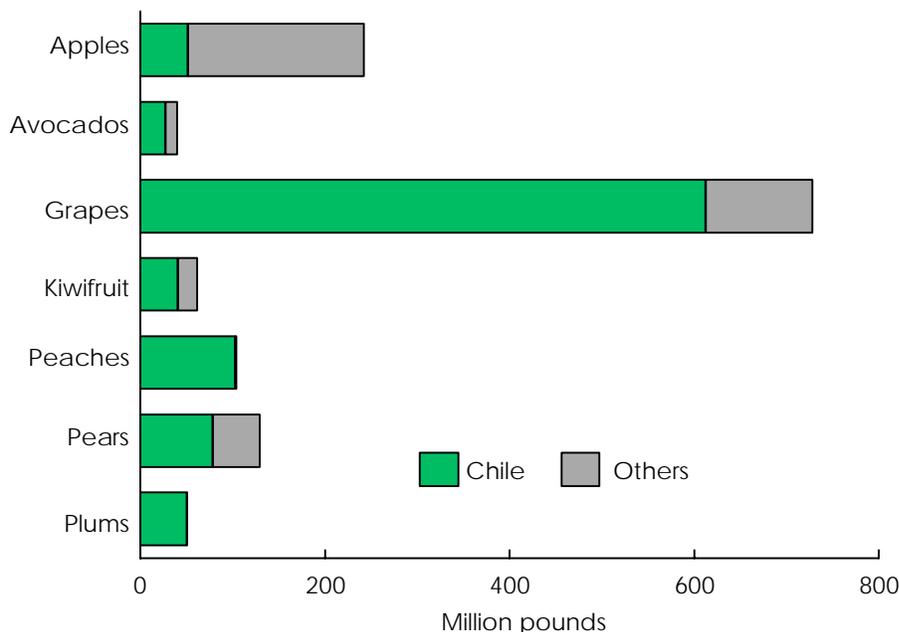
Imports account for 56 percent of the total fish and seafood eaten in the United States, up from about half in 1981-85. Of the more than 2.1 billion pounds of these products imported in 1991-95, just over 40

Figure 1
Fresh Vegetable Imports Peak in the Off-Season



Note: 1993-95 average.

Figure 2
Chile Is the Largest Supplier of Imported Fresh Noncitrus Fruits



Note: 1991-95 average.

percent were shrimp and canned tuna. A wide variety of others make up the remainder, including salmon, haddock, perch, sardines, mackerel, crabs, scallops, and squid. The bulk of fish and seafood imports—over 60 percent—enter the country frozen, with the remaining imports almost evenly split between fresh or chilled and processed.

Imports account for a much smaller share of red meat consumption relative to fish and seafood. They averaged 3.1 billion pounds per year during 1991-95, and accounted for 7 percent of total red meat supplies—reflecting a moderate increase over 10 years ago. Although relatively small in total volume, imported lamb accounted for the greatest share of U.S. consumption, at 14 percent (mostly from New Zealand), followed by beef (10 percent), and pork (4 percent). Fresh, frozen, and chilled meats—most of which is purchased for further processing—make up the bulk of red meat imports. Canned hams and corned beef are important processed meat imports.

Growing Imports of Olive and Canola Oils

Imports accounted for 13 percent of the 22 billion pounds of edible fats and oils consumed annually in the United States in 1991-95, up from 10 percent a decade before. Most of the increase was due to canola oil, approved for human food use by the U.S. Food and Drug Administration only in 1985. It now accounts for a third of total edible fat and oil imports. Also, imports of olive oil more than tripled from 10 years ago. Imports of tropical oils (palm oil, palm kernel, and coconut oil), however, have declined annually since 1993 as food manufacturers have switched to oils with less saturated fat.

Rice and Pasta Imports Growing Too

The United States is a net exporter of most rough and semiprocessed grains, such as wheat, wheat flour, corn, oats, and barley, with imports accounting for less than 2 percent of total consumption in 1991-95.

Rice imports, however, fueled by a growing demand for basmati and other specialty rices used widely in ethnic foods, have more than tripled over the past 10 years to 9.2 percent of total rice consumption. The bulk of imported rice comes from Thailand.

Imports of more processed grain products have also grown considerably in the 1990's. Pasta imports, for example, increased by 65 percent between 1991 and 1995. Italy is the major supplier of imported pasta to the United States.

Imported Cheeses Accounting for Declining Share of U.S. Total

Imports accounted for less than 2 percent of total U.S. dairy product consumption in 1991-95, and have remained a steady share of consumption since 1981-85. Most of these dairy imports were cheeses from Europe, New Zealand, and Australia.

Cheese imports as a share of total U.S. consumption have declined over the last decade, from 5.9 percent in 1981-85 to 4.6 percent in 1991-95, due mostly to a sharp increase in consumption of domestically produced mozzarella cheese. The shares differ markedly by type of cheese, with imports accounting for less than 1 percent of consumption of American cheese, but 8 percent of other cheeses. Swiss cheese, cheeses from sheep's milk (including Pecorino and Roquefort), and Italian-type cheeses (such as Parmesan, Reggiano, and Romano)

accounted for nearly half of total cheese imports.

Food Imports Offer Benefits and Concerns

Clearly, food imports offer consumers myriad benefits in terms of increased dietary variety, price stability, and year-round availability of popular food products.

With the recent attention to foodborne illness, some are concerned about the safety of foreign foods. Recent outbreaks of foodborne illness, some of which have been linked with imported foods, have increased public concern over whether there is a higher risk of foodborne illness from consumption of imported foods due to differences in water quality and farming practices in foreign countries. Others have concerns about the safety of imported produce from countries where chemical use may be less regulated and residue testing less frequent or sophisticated than in the United States.

On October 2, 1997, President Clinton announced an initiative to improve safeguards to ensure the safety of domestic and imported produce. The initiative calls for increased surveillance and testing of imported fresh fruits and vegetables to ensure that they meet the highest safety standards. Officials continue to work with producers in foreign countries to eliminate sources of foodborne illness and keep pesticide residues within safe limits.

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Trends in Eating Out

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This country has more than 785,000 places to eat out, ranging from hot dog vendors at the ball park to school cafeterias and fancy restaurants. Dining out continues to grow in popularity—from \$170 billion worth of meals and snacks (excluding alcoholic beverages) in 1986 to slightly over \$286 billion in 1996. These foodservice sales (sales of food eaten away from home) have grown faster than food sales in supermarkets, convenience stores, specialized foodstores, and other retail stores. Over the last decade, foodservice sales increased about 1.7 percent per year when adjusted for inflation, compared with a 1.1-percent inflation-adjusted annual rise in retail food sales.

Posting \$227 billion in sales in 1996, commercial establishments accounted for 79 percent of total foodservice sales (up 78 percent from a decade earlier, see table 1). Commercial foodservice establishments include separate eating places—such as full-service restaurants and lunchrooms, fast-food and quick-service outlets, cafeterias, and caterers. Other commercial foodservice operations that prepare, serve, and sell meals and snacks for profit to the general public include operations located in other facilities—lodging places, recreation and enter-

tainment facilities, and retail hosts (like department stores and limited-price variety stores). Separate drinking places (like bars and taverns) are also part of the commercial foodservice sector.

The remainder of foodservice sales take place in noncommercial operations, where meals and snacks are prepared and served as a support service in institutional and educational settings such as schools, nursing homes, child daycare centers, and hospitals (patient meals).

Fast Food and Restaurants Dominate Sales...

Fast-food outlets and restaurants dominate the foodservice landscape. These two segments had combined sales of \$179.2 billion and accounted for 63 percent of total foodservice sales in 1996 (compared with 61 percent in 1986). Sales at fast-food outlets rose \$1.0 billion in 1996 to \$93.5 billion, and sales at restaurants rose \$0.9 billion to \$85.7 billion.

Fast-food sales overtook those by restaurants in the late 1980's and have continued to be larger each year. Rapidly growing, newer quick-service chains like Boston Market and Kenny Rogers Roasters have cut into restaurant sales. These types of eating places offer complete home-style meals with several entrees and a variety of side dishes. Their quick service and varied offerings have proven popular with diners looking for alternatives to traditional fast-

food fare. Boston Market, for example, opened 258 new outlets in 1996—a 31-percent increase from the 829 outlets operating in 1995. Their sales grew from \$793 million in 1995 to \$1.166 billion in 1996.

Nontraditional fast-food markets, such as mobile operations/push-carts, concession stands in stadiums, and operations in colleges and high schools, have grown over the last few years and helped to push up fast-food sales.

...But the Largest Growth at Recreation/ Entertainment Facilities and Retail Hosts

Sales in the recreation and entertainment segment and the retail host segment increased about 160 percent between 1986 and 1996—the largest growth among the foodservice segments. Both segments posted gains over 1995 sales.

Higher attendance at theme parks, as well as athletic or country clubs, sports events, and recreation facilities, helps explain the big jump in recreation and entertainment foodservice sales.

Expanding commercial foodservice offerings in gas stations, convenience stores, bookstores, as well as grocery stores and warehouse clubs, may be responsible for the increase in food sales by retail hosts from \$6 billion in 1986 to \$15.7 billion in 1996.

The author is an economist with the Food and Rural Economics Division, Economic Research Service, USDA.

Noncommercial Foodservice Also Posted Gains

Noncommercial foodservice sales also grew, but at a smaller pace (41 percent) than commercial sales. These operations accounted for 21 percent of total foodservice sales in 1996, compared with 25 percent in 1986, as commercial vendors have taken over the foodservice operations in some noncommercial set-

tings (and their sales would be included under commercial sales).

Foodservice operations in elementary and secondary schools and in colleges and universities had higher sales in 1996 than in 1995. Sales more than doubled for college and university foodservice operations between 1986 and 1996 because of increased enrollments. Foodservice operations in child daycare centers nearly doubled, as the number of children in daycare centers grew

over the decade. Increased foodservice sales for elderly feeding programs and extended-care facilities bear witness to our growing elderly population.

Only three noncommercial industry segments showed declines over the decade. Troop feeding declined by 23 percent between 1986 and 1996, as the number of military personnel decreased. Hospital foodservice sales and vending sales also decreased during the decade. ■

Table 1
Fast-Food Sales Outpace Restaurants and Lunchrooms¹

Industry segment	Sales			Change, 1986-96
	1986	1995	1996	
	Million dollars			Percent
Commercial foodservice	127,949	221,786	227,247	78
Separate eating places:				
Restaurants and lunchrooms	53,027	84,753	85,661	62
Fast-food outlets	50,680	92,497	93,533	85
Cafeterias	3,505	4,273	4,319	23
Caterers	963	1,645	2,351	144
Other commercial:				
Lodging places	8,442	12,867	13,947	65
Retail hosts	6,027	14,556	15,706	161
Recreation and entertainment	3,830	9,628	10,097	163
Separate drinking places	1,475	1,567	1,633	11
Noncommercial foodservice	41,908	56,797	59,149	41
Education:				
Elementary and secondary	14,651	22,051	24,109	65
Colleges and universities	8,770	10,523	10,982	25
Colleges and universities	6,184	11,528	13,127	112
Military services:				
Troop feeding	1,696	1,496	1,674	-1
Troop feeding	1,066	646	822	-23
Clubs and exchanges	630	850	852	35
Plants and office buildings	3,966	6,446	6,527	65
Hospitals	3,496	3,384	3,350	-4
Extended care facilities	4,798	5,758	5,802	21
Vending	4,770	4,454	4,135	-13
Transportation	3,098	4,661	4,633	50
Associations	1,488	1,438	1,505	1
Correctional facilities	1,880	2,936	3,068	63
Child daycare centers	912	1,689	1,787	96
Elderly feeding programs	117	172	169	44
Other ²	1,036	2,312	2,390	131
Total foodservice sales	169,857	278,583	286,396	69

Notes: ¹Excludes sales taxes and tips. ²Includes more categories in 1995-96 than in 1986.

Food Spending Moderates in a Growing Economy

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In 1995, Americans spent about \$1,647 per person on food, up a modest 7 percent over 1990. Some groups varied substantially from the national trend. For example, blacks increased their food spending by 19 percent, and spending by single mothers rose by 17 percent.

Income and household size are the most important determinants of food expenditures. For example, households in the poorest 20 percent of the Nation's income distribution decreased their total food spending by 3 percent during 1993-95, while spending by middle-income and wealthy households increased by nearly 3 percent.

Most of the growth in food spending from 1990 to 1995 occurred in the retail food sector (food at home). Expenditures for food at home increased 15 percent from 1990 to 1995 (table 1). In the foodservice sector (food away from home) on the other hand, per person annual expenditures decreased 5 percent during this time span (fig. 1). While food spending generally continues to grow modestly, fluctuations can occur from year to year. For example, food spending fell 4 percent in

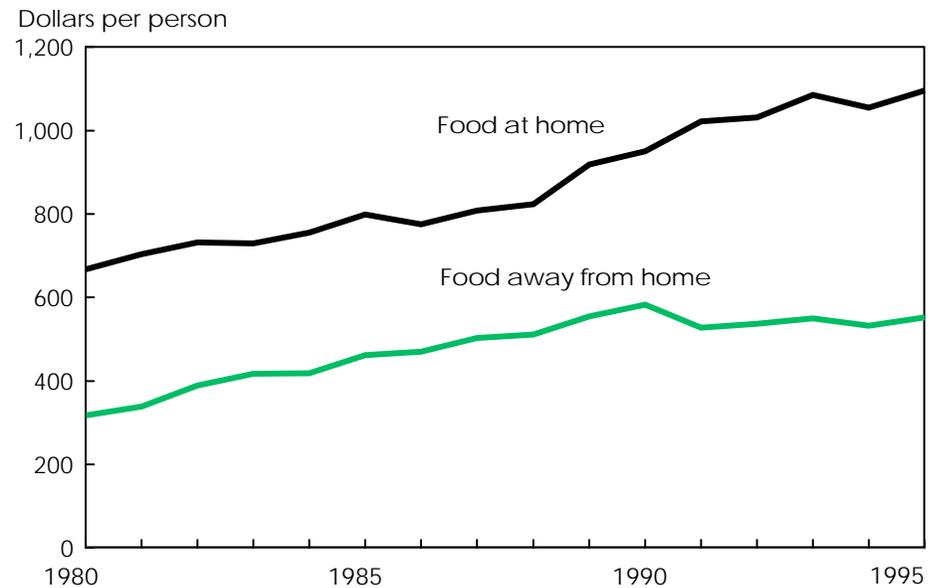
1994 even as other sectors of the economy thrived.

Food spending tends to more closely follow consumer income than the direction of the general economy (fig. 2). This occurs because growth in the general economy, as measured by the gross domestic product (GDP), is comprised not only of consumer expenditures but also private investment, imports and exports, and Government spending. However, sustained economic growth usually has posi-

tive impacts on employment rates and income levels, which eventually affect food spending levels.

Total consumer expenditures (including nonfood purchases) grew twice as fast (14 percent) as did food expenditures from 1990 through 1995. Meanwhile, income per person grew 11 percent (from \$13,052 to \$14,725) and GDP grew 21 percent (three times the rate of growth in food expenditures). Taken together, these figures suggest that growth in consumer income and the general

Figure 1
Food Spending Away From Home Levels Off in the Early 1990's



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Table 1
Households Moderate Food Spending Despite Gains in Income

Item	1980	1985	1990	1995
<i>Dollars</i>				
Annual household income before taxes	17,843	25,103	33,152	37,255
Food spending per person	985	1,260	1,533	1,647
Food at home	667	798	950	1,095
Cereal and bakery products	84	113	143	175
Meats, poultry, fish, and eggs	231	231	257	300
Dairy	84	101	110	113
Fruits and vegetables	101	130	162	183
Sugars and sweets	25	30	36	44
Fats and oils	22	27	30	37
Beverages	61	73	82	95
Miscellaneous foods	58	93	130	149
Food away from home	318	462	582	552
Breakfast and brunch ¹				41
Lunch	112	171	204	190
Dinner	133	215	274	269
Other meals and snacks ¹	72	77	104	51

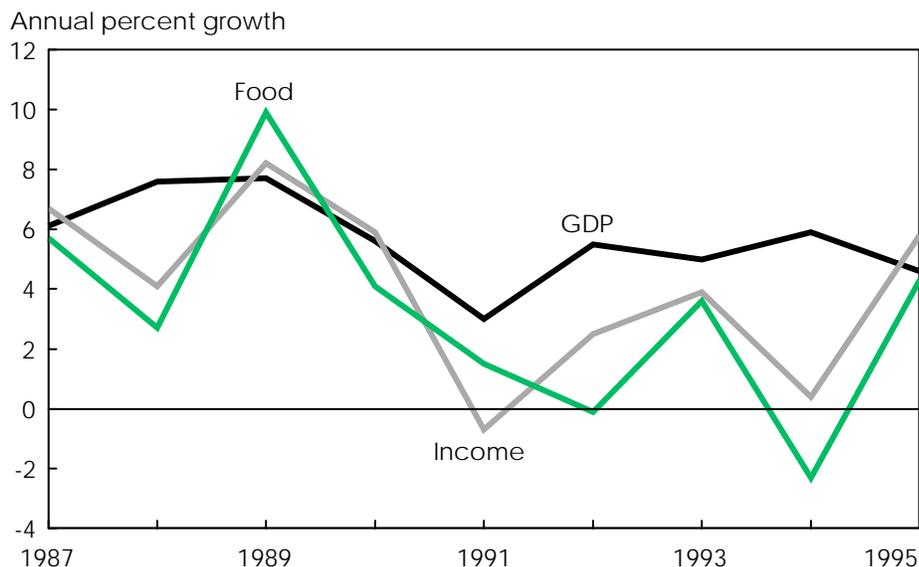
Note: ¹Breakfast and brunch included in other meals and snacks prior to 1993.

economy has outpaced consumer spending in the food sector. This is not unusual and confirms a fundamental principle of economics—the share of income spent on necessities falls as income rises.

Food expenditures have not kept up with inflation over the past 6 years, indicating that Americans have changed their eating habits in a way that costs them less money. Inflation has been low, at about 2.8 percent per year from 1990 to 1995. In comparison, food prices rose an average of 2.1 percent per year. Food expenditures rose an average of 1.1 percent per year.

Most of these findings are compiled from information contained in the Consumer Expenditure Survey (CES) released by the Bureau of Labor Statistics from 1980 through 1995. The CES data allow us to link consumer expenditures with demographic characteristics. The statistics

Figure 2
Food Spending More Closely Follows Income Growth Than Economic Conditions



and analysis presented in this article are based on the urban portion of the sample (representing about 87 percent of the noninstitutionalized population), since this group has been surveyed continuously since 1980.

Low-Income Households Continue To Spend Less Per Person

Income and household size continued to be the most influential factors affecting where and how Americans spend their food dollar (table 2). Households tend to spend more money on food as their

incomes rise because they buy higher quality food items, more convenience foods, and spend more in restaurants. In 1995, low-income households (whose before-tax incomes averaged \$6,826) spent about \$1,310 per person, about 40 percent less than what the wealthiest households (incomes averaging \$86,098) spent (\$2,183 per person). Middle-income households (incomes averaging \$29,315) spent about \$1,590 per person—about 27 percent less than the wealthiest households and 21 percent more than low-income households.

These gaps have widened since 1992, when low-income households

spent about 37 percent less than the wealthiest households. In 1992, middle-income households spent about 24 percent less for food than did the wealthiest households and about 18 percent more than did low-income households.

While the amount spent on food increases with household income, the proportion of income spent on food decreases as income rises. In 1995, low-income households spent about 35 percent of their income on food, while middle-income households spent about 14 percent, and the wealthiest households spent less than 8 percent. These figures have remained about the same since 1992.

Table 2
Food Spending Varies Substantially With Demographic Profile

Demographic category	Food spending per person				Change		
	1980	1985	1990	1995	1980-85	1985-90	1990-95
	<i>Dollars</i>				<i>Percent</i>		
All urban households	985	1,260	1,533	1,647	28	22	7
Household size:							
One person	1,268	1,713	2,107	2,330	35	23	11
Two person	1,195	1,561	1,939	2,039	31	24	5
Three members	952	1,228	1,545	1,618	29	26	5
Four members	891	1,107	1,350	1,435	24	22	6
Five members	828	975	1,107	1,282	18	14	16
Six or more members	726	811	877	964	12	8	10
Single female parent with children	647	857	1,011	1,187	32	18	17
Income category:							
Lowest	857	987	1,279	1,310	15	30	2
Middle	943	1,200	1,416	1,590	27	18	12
Highest	1,171	1,647	2,041	2,183	41	24	7
Race:							
White	1,031	1,322	1,598	1,711	28	21	7
Black	691	869	1,076	1,282	26	24	19
Other	919	1,207	1,607	1,563	31	33	-3
Age of householder:							
Under 25 (nonstudent)	902	1,084	1,407	1,330	20	30	-5
25-34 years	963	1,109	1,370	1,468	15	24	7
35-44 years	920	1,212	1,497	1,557	32	24	4
45-54 years	1,016	1,401	1,690	1,805	38	21	7
55-64 years	1,119	1,477	1,688	1,901	32	14	13
Over 64 years	1,045	1,367	1,624	1,861	31	19	15

As expected, wealthier households spent more money and a larger share of their food budget on food away from home. The wealthiest households spent 47 percent (\$915) of their food budget on food away from home in 1995, while the poorest group spent 27 percent (\$304) and middle-income households spent 37 percent (\$535).

Expenditures on food at home increased about 6 percent across all income groups between 1992 and 1995, but spending on major food groups varied by income level.

For example, while middle-income and higher income households increased their dairy product expenditures by 2 and 3 percent, respectively, low-income households decreased their expenditures by 11 percent. This increased the gap in expenditures between the lowest and highest income households for dairy products to about \$34 per person annually.

On the other hand, households with the lowest income increased their expenditures on meats, poultry, fish and seafood, and eggs by 8 percent, while those in the highest income group increased their expenditures by 4 percent, and those in the middle-income bracket increased by only 2 percent. Within this group of foods, low-income households made their largest increase in expenditures in fish and seafood—unlike households with higher income levels whose greatest increases came in poultry purchases (whereas low-income households decreased their expenditures on poultry).

Households of all income levels increased their expenditures on fresh and processed fruits and vegetables by about 4 percent. However, low-income households decreased their spending on fresh vegetables, while households of other income levels increased their expenditures. Fresh fruit expendi-

tures increased by 18 percent in low-income households, compared with 10 percent for middle-income households and 11 percent for the wealthiest households. Spending on processed fruits, particularly orange juice, fell for all income levels.

Expenditures on cereal and bakery products also increased faster for low-income households than for higher income households between 1992 and 1995. Low-income households increased their expenditures by 11 percent, from \$146 per person in 1992 to \$162 in 1994, while the wealthiest households increased their spending by 6 percent. Since bread and cereals are an important part of USDA's Food Guide Pyramid, this increase is an encouraging sign for the healthfulness of low-income household food choices.

Household Size Plays Major Role in Spending

The amount a household spends on food of course increases as the size of a household increases, but it increases at a slower rate. That is, if the size of the household doubles, food spending does not typically double. Larger households tend to spend less per person, because they purchase more economical packages of food and have more home-cooked meals (as opposed to meals eaten at restaurants) than do smaller households. Also, many multiperson households contain children, who do not eat as much food as adults do. In 1995, single-person households paid \$2,330 for food, while households with six or more members paid \$964 per person (the average household size was 2.53 persons). Three-person households spent \$1,618 per person for food.

Single-person households spent about 40 percent of their food budget eating out in 1995, while three-person households spent 32 percent. Households with six or more mem-

bers spent only 22 percent their food budget at eating places. This mix of budget allocations makes sense from a practical standpoint, because some foods are available only in standard sizes, such as a loaf of bread, that may largely go wasted by a single-person household but is easily consumed by a larger household. Single-person households may eat out more often to avoid waste and to socialize, while larger households probably eat at less expensive restaurants to lessen the total bill or eat out only as a treat or on special occasions.

Household size also affects the mix of food spending within the household. For example, larger households tend to spend a larger share of their at-home food dollar on basic ingredients for recipes and on lower priced items, such as grain products, milk, and ground meat. Smaller households spend a larger share of their home food budget on other foods, such as fresh fruits and vegetables, steak, and frozen dinners.

Food Spending Varies With Household Composition

The composition of households is also an important factor in food spending patterns. In 1995, 43 percent of married couples with no children at home spent more per person on food than did other types of households, including single-person households. For example, married couples without children in the household outspent most other types of households by about a third on beef—mainly steaks. Married couples with children living at home spent more per person as their children got older, but their per person expenditures were still lower than

those of single-person households and married couples without children living at home.

Single mothers spent less per person than did most other types of households in 1995. They also had lower before-tax incomes than did other types of households. The mothers averaged about 35 years of age and typically had about 2 children under 18 years living with them. Only about 22 percent of their food budget was spent on food away from home. The largest share of their at-home food budget (31 percent) went to meats, poultry, fish, and eggs, with beef leading the way. They also spent substantial shares on cereal and bakery products (16 percent), fruits and vegetables (15 percent), and dairy products (10 percent).

Blacks Had the Largest Increases in Food Spending

Black households spent about \$1,282 per person for food in 1995, an 11-percent increase over 1992 spending levels. Spending by white households and those of other races increased 5 percent and 2 percent, respectively, during that period. However, blacks still spend less on food per person than do other households due to their comparatively lower income.

In 1995, black households spent less for most broad categories of food, except meats, poultry, fish, and eggs. For example, they spent \$79 per person for pork, while whites spent \$59 per person. Black households spent about \$67 per person annually on poultry, compared with \$54 spent by whites.

Food Expenditure Levels Follow Income Trends

Since food is more of a necessity than many other goods and services, expenditures on food during economic growth periods is generally more lackluster than the overall economy. While steady growth in the economy, particularly when it is transferred to income growth, can increase food expenditures, it is not likely to increase those expenditures as much as other sectors in the economy might experience.

Nonetheless, as long as the general economic conditions are favorable, there should be a continued and steady growth in food expenditures. And, as the demographic profile of America changes, the types of foods purchased by its population will likely change. ■

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Spotlight:

National Food Spending

Spending for Food Away From Home Slowed in 1996

Food spending in the United States rose to \$691.2 billion in 1996, a 3.3-percent increase over 1995 (table 1). Total expenditures for eating out (food away from home) rose 2.8 percent to \$316.4 billion in 1996, less than the 4.4-percent increase in 1995. Retail food expenditures (food at home) increased at the same pace as 1995, rising 3.7 percent in 1996 to \$374.8 billion. Once adjusted for inflation, total food spending rose 0.1 percent in 1996—food at home was unchanged, while food away from home rose, up 0.3 percent. The faster growth for food away from home in 1996 is not unusual in a nonrecession year.

During the 1990-91 recession, inflation-adjusted spending on food away from home declined 0.4 percent, while spending for food at home rose 1.3 percent. One of the ways people economized during the 1990-91 recession was by eating out less often or by going to less expensive places. The share of total food dollars spent away from home declined from 44.7 percent in 1989 to 44.1 percent in 1991, reflecting the economic slowdown and the subsequent recession.

But with economic recovery came increased away-from-home food spending. In 1992, 1993, and 1995, spending for food away from home rose faster than at-home food spending (in 1994, spending for both categories increased at the same rate). By 1995, spending for food away from home had reached new highs—46.0 percent of food expenditures and 35.0 percent of food quantities—continuing the recovery that started in 1992. In 1996, the share of food dollars spent away from home dipped slightly to 45.8 percent. Vigorous competition among fast-food and restaurant chains held down prices and sales for away-from-home eating, and at-home sales increased more.

Food-Away-From-Home Sales Expected To Have Increased in 1997

Preliminary figures on food sales (a beginning point for estimating food spending) in the first 11 months of 1997 show spending returning to its previous pattern, with at-home food spending up 2.5 percent from the same period in 1996 and away-from-home food spending up 3.7 percent. Food sales exclude donations and food furnished to employees, patients, and

inmates—all of which are included in the total food expenditures reported above. (Comparing 1996 with preliminary 1997, inflation-adjusted food sales were lower, with at-home food spending down 0.1 percent and away-from-home spending up 0.8 percent.)

Updated Data Available

Newly revised figures will be available from USDA's Economic Research Service twice a year—Spring and Fall—through the AutoFAX system.

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When responding to the voice prompts, please note: when asked for a yes or no response, press 1 for yes and 2 for no. You may interrupt the main menu choices to order the document by pressing 4—the system will then prompt you for the document number.

Table 1
Food Spending Rose 3.3 Percent in 1996

Expenditures	1991	1992	1993	1994	1995	1996	Change, 1995-96
							Percent
	<i>Billion dollars</i>						
Total food and beverages ¹	662.8	674.0	695.8	729.1	757.7	782.8	3.6
Total food (excluding alcohol)	580.3	591.4	612.6	643.3	669.4	691.2	3.3
At-home food	324.6	326.5	331.9	348.5	361.5	374.8	3.7
Sales	317.3	319.3	325.1	341.3	354.2	367.5	3.8
Home production and donations	7.3	7.2	6.8	7.2	7.3	7.3	.2
Away-from-home food	255.6	265.0	280.7	294.8	307.9	316.4	2.8
Sales	231.5	239.8	255.4	268.7	280.8	288.5	2.7
Supplied and donated ²	24.2	25.2	25.3	26.1	27.1	27.9	2.9
Alcoholic beverages	82.5	82.5	83.2	85.7	88.4	91.6	3.7
Packaged	47.3	46.3	46.1	47.7	48.4	50.1	3.5
Drinks	35.2	36.2	37.1	38.1	40.0	41.5	3.9

Notes: Data may not total due to rounding. ¹These expenditures include all food and alcoholic beverages, regardless of who paid for them. ²Includes Government subsidies for school lunch programs.

Table 2
Rise in Personal Food Expenditures Slightly Lower Than Disposable Personal Income¹

Component	1994	1995	1996	Change, 1995-96
				Percent
	<i>Billion dollars</i>			
Disposable personal income	5,021.7	5,320.8	5,589.0	5.0
Total personal consumption expenditures	4,717.0	4,957.7	5,207.6	5.0
Food	562.6	586.9	606.8	3.4
At home	343.9	357.0	370.5	3.8
Away from home	218.7	229.9	236.3	2.8
Alcoholic beverages	72.1	74.0	76.7	3.6
At home	47.7	48.4	50.1	3.5
Away from home	24.4	25.6	26.6	4.0
Nonfood	4,389.7	4,620.8	4,840.5	4.8
Housing, household operation, supplies, fuel, furniture	1,311.1	1,382.6	1,451.9	5.0
Transportation, cars, gasoline	542.2	572.3	602.3	5.2
Medical care, drugs	813.2	858.5	899.0	4.7
Clothing, shoes, toiletries, personal care, jewelry	343.3	356.0	370.3	4.0
Recreation, tobacco, toys, sporting goods, pet food	280.5	304.5	326.4	7.2
Personal business	370.4	389.1	421.1	8.2
Other	327.3	336.9	367.1	9.0

Notes: Data may not add due to rounding. Food expenditures in this table are only those paid for by consumers with cash or food stamps. Disposable personal income is the sum of personal consumption expenditures plus savings plus other miscellaneous expenditures. ¹As of July 31, 1997. Sources: Food and alcoholic beverage data are from USDA's Economic Research Service. All other data are from the Bureau of Economic Analysis, U.S. Department of Commerce.

Personal Food Spending Posted Modest Increase

Since the 1990-91 recession, personal food spending has increased less than most other major categories of personal consumption. Personal food spending differs from total food spending because it excludes expenditures by governments and businesses. Personal expenditures for all food rose 3.4 percent in 1996, while spending on transportation, cars, and gasoline went up 5.2 percent, and medical care and drugs increased 4.7 percent (table 2). Within personal food

expenditures, there was a 2.8-percent growth in away-from-home food expenses, compared with a 3.8-percent increase in expenditures for food at home. Most food expenditures by governments and businesses (such as feeding prisoners, military messes, business travel and entertainment) is for food away from home, so personal food expenditures may behave differently than total food spending.

In 1996, 10.9 percent of a household's (families and individuals) disposable personal income was spent on food, down from 12.0 percent in 1985. Households spent 6.6 percent

of their 1996 disposable personal income for food at home and 4.2 percent on food away from home. A decade earlier, Americans were spending 7.5 percent of their disposable personal income for food at home and 4.3 percent for food away from home. In 1996, Americans spent about 28 percent of disposable personal income on housing (including supplies, fuel, and furniture), 17 percent on medical care and drugs, and 12 percent on transportation (including cars and gasoline).

—By Annette Clauson (202) 694-5373 and Alden Manchester. ■

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Farm Value Grew More Than Marketing Costs in 1996

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U.S. consumers spent \$546.5 billion on food in 1996 (excluding imports and seafood), \$17 billion more than in 1995. For every dollar spent, 23 cents covered the farm value of food purchases, and the remaining 77 cents covered the cost of marketing these products. Food marketing costs—as measured by USDA's mar-

keting bill—includes expenses associated with processing, wholesaling, distributing, and retailing of foods produced by U.S. farmers and eaten by U.S. consumers. It is the difference between the value farmers receive for food commodities and the amount consumers spend on food both at home and away from home.

The marketing bill rose 1.9 percent in 1996, following a 3.7-percent increase in 1995 (table 1). This increase was considerably smaller than the 1996 general inflation rate of 2.9 percent. The small increase in

1996 was the result of a sharp increase in the farm value (7.9 percent) which surpassed a modest 3.2-percent increase in consumer food expenditures, and moderate inflation which restrained marketing cost increases. The farm value had a larger impact than the marketing bill on increases in 1996 consumer expenditures—something that has not happened since 1973. Retail food sales rose sluggishly, reflecting modest food price increases.

In addition to recording a higher percentage increase than the marketing bill, the farm value grew more in

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Table 1
Labor Costs Are the Largest Share of Food Expenditures

Component	1980	1985	1990	1995	1996
<i>Billion dollars</i>					
Labor ¹	81.5	115.6	154.0	196.6	206.3
Packaging materials	21.0	26.9	36.5	47.8	46.9
Rail and truck transportation ²	13.0	16.5	19.8	22.3	22.9
Fuels and electricity	9.0	13.1	15.2	18.6	19.3
Pretax corporate profits	9.9	10.4	13.2	22.8	24.0
Advertising	7.3	12.5	17.1	20.0	20.8
Depreciation	7.8	15.4	16.3	18.7	19.4
Net interest	3.4	6.1	13.5	11.7	12.1
Net rent	6.8	9.3	13.9	19.6	20.2
Repairs	3.6	4.8	6.2	8.0	8.3
Business taxes	8.3	11.7	15.7	19.4	20.1
Total marketing bill	182.7	259.0	343.6	415.7	423.7
Farm value	81.7	86.4	106.2	113.8	122.8
Consumer expenditures	264.4	345.4	449.8	529.5	546.5

Notes: ¹Includes employees' wages/salaries and health and welfare benefits. ²Excludes local hauling charges.

absolute dollar terms. The farm value rose \$9 billion, while the marketing bill grew \$8 billion. The higher farm value reflected higher farm prices of pork, eggs, dairy products, and grains.

Eggs, Poultry, Fresh Fruit, Wheat, and Dairy Post Large Farm Value Gains

Changes in retail prices, the farm value, and the farm-to-retail spread for major food groups are derived from USDA's market basket, which measures price changes for foods sold in the at-home market. In contrast, the marketing bill data series considers both the at-home and away-from-home markets (see box).

Eggs posted the largest increase in farm and retail prices—25.9 percent and 17.9 percent, respectively (table 2). However, eggs account for only a small percentage of the market basket, so their impact on aggregate farm-level increases is relatively small. Retail prices of eggs are relatively sensitive to farm value fluctuations, because there is relatively little processing involved in marketing eggs. Higher feed costs and strong export demand were primarily responsible for the hike in both the farm value and retail price of eggs.

These same conditions were also responsible for an 11-percent increase in the farm value of poultry, following a 0.8-percent decline in 1995. Much of this increase was passed on to the retail level, so retail poultry prices climbed 6.2 percent in 1996, after rising only 1.4 percent the previous year. Higher farm values also caused a slightly smaller increase in the 1996 poultry farm-to-retail spread.

Fresh fruits posted one of the larger 1996 price increases at all three levels of the marketing system (farm value, farm-to-retail spread, and retail cost), although the increase was less than in 1995. The rise was mostly due to weather-

related damage in California and cold weather in the Pacific Northwest that reduced supplies.

The farm value of cereal and bakery products surged 14 percent in 1996, reflecting tight wheat supplies. However, the spread rose only 3 percent, resulting in a 3.9-percent increase in retail prices of cereal and bakery products. The large jump in the farm value would be expected to produce only a small bump at the retail level, in view of the small farm value percentage.

The farm value of dairy products surged 16.3 percent, reflecting increased slaughter of dairy cows due to high feedgrain prices and adverse forage conditions. The farm-to-retail spread for dairy showed one of the smallest increases of any category (2.3 percent), as the farm value narrowed the spread at a faster pace than a retail price increase of 7.0 percent could compensate.

In contrast, the farm value of fresh vegetables dropped 12.9 percent, helping to bring down the retail

The Market Basket and Marketing Bill Measure Food Marketing Costs in Different Ways

USDA uses its **market basket** concept to track food price changes in grocery stores and to determine the underlying causes of changes in grocery store prices. The market basket contains the average annual quantities of foods purchased per household in a base period (currently 1982-84). Since the basket relies on a fixed set of quantities, changes in the value of the market basket are strictly the result of changes in price. The market basket consists of three components—the retail price, the farm value, and the farm-to-retail price spread.

The **retail price** component of the market basket is a subset of the Consumer Price Index for Food at Home, adjusted to exclude imported foods, nonalcoholic beverages, and seafood. Moreover, food purchased for away-from-home consumption is excluded from this estimate. The retail price index for the market basket has two parts:

- The **farm value** represents the prices received by farmers for the quantities of raw farm commodities that must be purchased from farmers in order to sell a unit of food product at retail.
- The **farm-to-retail price spread** is the difference between retail price and farm value, and represents the costs of processing,

wholesaling, and retailing foods. The price spread concept should be distinguished from the concept of margins as defined and used in the food trade. The farm-to-retail price spread represents the difference between average prices at two levels of the food marketing system *at a given point in time*. A margin is the difference between sales of a good or goods and the cost of goods sold. Margins allow for pricing inputs *at a different point in time* than the one in which the product is sold.

The **marketing bill** differs from the farm-to-retail price spread in several important ways. The bill is the difference between consumer expenditures for foods produced on U.S. farms and an associated farm value. However, product quantities are allowed to vary from year to year, in contrast to the fixed quantities used to develop market basket estimates. Therefore, changes in the marketing bill may result from changes in price, product mix, product quantity, and the quantity of marketing services. Thus, the bill measures changes in marketing costs, whereas the market basket measures changes in prices. Moreover, the bill includes both the at-home and away-from-home markets.

Table 2

Farm Value Was Higher For Most Market Basket Food Categories

Item	1980	1985	1990	1994	1995	1996
	<i>Annual percent change</i>					
Food market basket:						
Retail price	7.2	1.2	7.1	2.5	2.8	4.4
Farm value	5.0	-7.1	5.6	-3.3	1.3	8.1
Farm-to-retail spread	8.6	5.6	7.8	4.4	3.3	3.2
Farm value percentage of retail cost	37.3	32.4	29.7	24.4	24.1	24.9
Meat products:						
Retail price	2.9	-.9	10.1	.6	.1	3.4
Farm value	.1	-8.1	12.7	-10.4	-2.4	7.0
Farm-to-retail spread	5.8	6.4	7.8	7.9	1.4	1.5
Farm value percentage of retail cost	50.7	46.8	46.0	35.9	35.1	36.3
Dairy products:						
Retail price	9.8	1.9	9.4	1.8	.8	7.0
Farm value	9.1	-4.0	2.6	1.5	-2.3	16.3
Farm-to-retail spread	10.4	7.1	14.3	2.0	2.5	2.3
Farm value percentage of retail cost	51.6	44.3	38.5	34.4	33.3	36.2
Poultry:						
Retail price	5.2	-1.0	-.2	3.4	1.4	6.2
Farm value	3.9	-6.0	-8.1	2.8	-.8	11.0
Farm-to-retail spread	6.5	5.4	7.0	3.9	3.0	2.8
Farm value percentage of retail cost	54.4	53.3	43.5	43.3	42.4	44.3
Eggs:						
Retail price	-1.8	-16.6	4.7	-2.4	5.4	17.9
Farm value	-5.2	-22.2	.5	-6.1	9.1	25.9
Farm-to-retail spread	4.6	-6.5	10.9	1.0	2.2	10.5
Farm value percentage of retail cost	64.2	60.6	55.9	47.0	48.6	51.9
Cereal and bakery products:						
Retail price	11.5	3.8	5.7	4.1	2.0	3.9
Farm value	15.5	-8.4	-10.9	12.1	7.1	14.0
Farm-to-retail spread	10.4	5.5	7.4	3.5	2.4	3.0
Farm value percentage of retail cost	14.4	10.7	7.9	7.7	7.5	7.2
Fresh fruit:						
Retail price	5.1	11.1	12.9	6.6	8.7	7.1
Farm value	-5.7	-2.6	18.2	-11.4	14.1	11.4
Farm-to-retail spread	9.9	18.0	11.3	11.7	7.4	6.1
Farm value percentage of retail cost	26.1	29.6	23.2	18.1	19.0	19.7
Fresh vegetables:						
Retail price	8.8	-4.3	5.6	2.3	12.1	-2.0
Farm value	2.9	-14.0	.9	-7.1	10.2	-12.9
Farm-to-retail spread	11.2	.6	7.6	5.5	12.6	1.2
Farm value percentage of retail cost	26.7	30.5	28.0	23.9	22.9	20.3
Processed fruit and vegetables:						
Retail price	7.0	2.6	6.2	2.3	2.2	5.0
Farm value	5.8	10.2	8.8	5.1	7.1	.8
Farm-to-retail spread	7.3	.3	5.2	1.5	1.1	6.2
Farm value percentage of retail cost	23.2	26.2	25.8	19.9	20.6	19.3
Fats and oils:						
Retail price	6.6	2.2	4.2	2.7	2.8	2.3
Farm value	-10.0	-16.1	12.0	16.8	-3.4	-7.4
Farm-to-retail spread	15.3	10.4	2.1	-1.2	4.8	5.5
Farm value percentage of retail cost	28.8	25.8	22.8	25.3	23.8	21.5

Notes: Changes in retail prices are from the Consumer Price Index published by the U.S. Department of Labor, Bureau of Labor Statistics. The farm value is based on prices farmers received for commodities equivalent to food at retail. The spread between the retail price and farm value represents charges for processing and marketing. Data for 1996 are preliminary.

prices of vegetables 2 percent. Since farm prices decreased faster than retail prices, the farm-to-retail spread widened 1.2 percent. The farm value drop was primarily the result of a record-large crop of fall potatoes, which dropped farm prices for fresh potatoes by 50 percent. Potatoes are the single largest component of the fresh vegetables category.

Change in Marketing Costs Reflects Moderate Labor Cost Increases...

Despite the unusual trends delineated for 1996, it should be remembered that marketing costs are largely independent of farm prices, as reflected in instances where retail prices have held firm or risen, even though farm prices declined. Over the years, marketing costs have tended to rise, regardless of whether farm prices rose or fell. Thus, increases in marketing costs can, and often do, exceed the effect of a change in farm prices on retail prices.

While farm values for many commodities increased over 10 percent in 1996, marketing costs still exerted more influence on expenditures by accounting for 77 percent of total consumer food spending. Over the last decade, the marketing bill rose an average of 4.6 percent per year. In 1996, the bill rose only 1.9 percent after increasing 3.3 percent in 1995. Marketing costs were kept in check by moderate increases for most marketing inputs, as well as lower packaging costs.

Labor costs (wages and salaries, and employee benefits such as health insurance) constitute 38 percent of total consumer food expenditures, and are the largest component of the marketing bill. Labor costs grew about 4.9 percent in 1996, slower than the annual average rise

of the last 10 years (5.3 percent). This slower pace reflected small increases in food industry employment, wages, and benefits.

Food industry employment increased 1.4 percent in 1996, a smaller rate of increase than the 2.9-percent rise recorded in 1995. In 1996, 13.5 million people were employed in the food sector beyond the farm. About 25 percent worked for foodstores, 12 percent for food manufacturers, and 7 percent for wholesalers. Eating and drinking places represented the single largest share, 56 percent.

The small increase in the number of people employed by the post-farm food sector in 1996 reflects weak sales increases at foodstores, which dampened industry demand for personnel. Food manufacturing employment dropped 1.6 percent, reflecting higher labor productivity and increased use of technology, which continued to dampen hiring rates. The rate of employment increase was smaller in 1996 than 1995 for retailing, wholesaling, and foodservice.

Hourly earnings of food manufacturing employees rose 2.6 percent in 1996, about the same as the 1995 rise. Average hourly earnings of foodstore workers rose 2.8 percent, compared with 2.6 percent in 1995. The relatively stable rates of increase in these two sectors partially reflect provisions of union contracts negotiated over the last few years. Average hourly earnings of wholesaling employees rose 2.3 percent, compared with 2.6 percent in 1995. The average hourly earnings of eating and drinking place employees advanced 3.6 percent, compared with 2.2 percent in 1995. This higher rate of growth reflects brisk sales in the away-from-home market during most of the last decade, when sales increased an average of 5.1 percent per year. Moreover, this sector was one of the highest contributors to U.S. job growth in 1996.

Wage supplements, about 20 percent of total labor costs, increased because of rising health insurance premiums and pensions. The rising cost of medical care pushed up health insurance costs. However, the 3.5-percent increase in the Consumer Price Index for medical services in 1996 was considerably smaller than the 6.5-percent average annual increase over the last 10 years, and helped mitigate 1995 labor cost increases. Similarly, the Employment Cost Index for private industry benefits rose just 1.8 percent in 1996, much less than the 5.9-percent average annual rise of the last decade.

...Lower Packaging Costs...

Packaging costs, which total 8.5 percent of food expenditures, fell 2 percent in 1996 and restrained aggregate food marketing costs. The price of paperboard (which accounts for about 40 percent of food industry packaging costs) fell 7.2 percent in 1996, following a record 16-percent rise the previous year. In 1995, the paper industry experienced the most rapid price increase in its history, stemming from an inability to add capacity fast enough to meet demand. In 1996, paperboard prices dropped after customers like the food industry restocked their inventories.

Meanwhile, the price of metal cans dropped 10.2 percent in the face of excess beverage can capacity due to increased demand for competing plastic containers. Despite this increased demand, plastic container prices dropped 1.2 percent, as producers were unable to raise prices in the face of price reductions for competing packaging products. Demand for packaging products prevented sales volumes from falling as fast as packaging prices.

...And Moderate Rises in Other Costs

Transportation costs, accounting for 4 percent of food expenditures, rose 2.5 percent—about the same as in 1995. This increase was primarily due to higher trucking rates, which climbed 2.4 percent. Higher fuel costs were the primary factor driving trucking costs, as petroleum prices surged nearly 20 percent and raised overall trucking fuel costs by 11 percent. Gasoline and petroleum costs surged in the face of unusually cold winter weather and low fuel inventories. Together, labor and fuel account for the main source of trucking expenses, accounting for 44 percent of the total. Railroad rates were only slightly lower.

Energy costs rose 3.8 percent in 1996, and totaled 3.5 percent of food expenditures. Energy costs increased despite a 2.0-percent drop in the price of electricity. Electricity makes up 55 percent of the energy costs incurred in food manufacturing, with natural gas accounting for the remaining 45 percent. Electricity accounts for 85 percent of the energy used by eating places and nearly all of the energy used in foodstores. Higher energy costs were largely the result of a 4.1-percent rise in the price of natural gas and increased volume of marketing services as measured by the higher 1996 marketing bill. In contrast to transporta-

tion, fuel cost increases did not have a large impact on direct energy costs because of electricity's dominant role in supplying the food industry's energy requirements.

Advertising expenses, which account for about 4 percent of food expenditures, rose 4 percent in 1996 following a 3.6-percent increase in 1995. Advertising expenditures have risen slightly faster than total marketing costs during the last few years. Food manufacturing makes up about 55 percent of total food industry advertising expenditures, with foodservice (restaurants, fast-food outlets, and others) contributing another 25 percent, and food retailing adding another 14 percent to the total. The food industry uses a mixture of print and broadcast media to promote their products.

Business taxes account for another 3.5 cents of the American food dollar. Business taxes include property, State, unemployment, insurance, and Social Security taxes, but exclude Federal income taxes. Business taxes rose 3.6 percent in 1996.

Net interest accounted for only 2 percent of total consumer expenditures. The 3.4-percent increase in 1996 interest expense occurred despite interest rate declines, because long- and short-term loans booked during years of rising interest rates are included in the estimates. Depreciation, rent, and repairs totaled \$47.9 billion in 1996, accounting for 8.5 percent of the

consumer food dollar. Foodservice establishments incurred high property rental expenses, and thus had the highest total of any sector. The foodservice sector incurred about 41 percent of these costs, foodstores made up 27 percent, and manufacturing and wholesaling firms together accounted for the remaining 32 percent.

Profits grew 5.3 percent in 1996, considerably less than the 9.1-percent rise recorded in 1995. Retail foodstores accounted for most of the profit gain in 1996 by attracting customers to cheaper generic brands and nonfood services such as instore pharmacies, greeting cards, health and beauty care, and video rentals. These items are especially appealing to customers seeking one-stop shopping convenience. *Supermarket Business* magazine reports that these products account for as much as 20 percent of total store profits, while constituting only 10 percent of store volume. However, profits were mitigated by a variety of conditions in the other food industry sectors. For example, food processors were unable to raise prices due to the moderate inflationary environment, and were further squeezed by higher farm prices. Meanwhile, competition among restaurants—particularly fast-food outlets—has restrained profit levels among eating and drinking places. ■

First Major Drop in Food Product Introductions in Over 20 Years

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About 320,000 packaged foods are available in the U.S. marketplace (although not all at once and not in every retail store). And about 15,000 new food products were introduced on average each year during 1993-95. Included are different sizes, colors, and flavors; seasonal and regional items; and products sold specially in gourmet, health food, and drug stores.

Many new product introductions are only changes in size or color, and not new in the sense of being truly innovative. And, despite the introduction of 93,000 products since 1990, the number of total products stocked in the Nation's grocery stores has shown little upward movement, suggesting that new products replace existing products or are removed from grocery store shelves soon after their introduction.

In 1996, manufacturers introduced 19,572 new products (13,266 foods and 6,306 nonfood items) in U.S. retail stores. The majority of food product introductions are new bakery foods, beverages, candies, condi-

ments, and dairy products, accounting for about 75 percent of all food product introductions.

While the number of nonfood grocery items increased 10 percent from 5,709 to 6,306, the number of new food products introduced fell 21 percent from 16,863 in 1995 to 13,266 in 1996—the sharpest yearly decline since the early 1970's. This is in sharp contrast to an average 8-percent growth per year between 1992 and 1995. Manufacturers may have pulled back on the number of products they offer to save costs or they may have just concentrated their marketing efforts on their core products.

While we do not know why introductions fell off, let alone so sharply, we do know that the decline in 1996 took place among all food product categories except packaged fruit and vegetables, which rose slightly (table 1). The number of new bakery products and beverages dropped by a little over 500 each (to 1,340 and 2,310, respectively), while about 900 fewer condiments were introduced (to 2,815).

New products addressing health concerns—such as those advertising lower salt, fat, and cholesterol levels, or higher fiber and calcium levels—continue to be at the forefront of introductions, but there were

notable drops in some categories. Introductions of foods claiming lower levels of fat rose from 1,914 in 1995 to 2,076 in 1996, but new low-calorie items dropped from 1,161 to 776. The number of new products with low salt, reduced/low sugar, and high fiber all showed a decline. The number of new food products with organic or low cholesterol claims was higher, however (table 2).

Small and medium-sized companies introduce the bulk of new products—11,738 in 1996. The 20 largest food companies introduced 1,528 new food products in the United States in 1996 (table 3).

Introducing new products helps U.S. farmers find more outlets/markets for their commodities. For example, the introduction of frozen concentrated orange juice in the 1950's contributed to sharp increases in consumption of oranges. Per capita consumption of oranges (fresh and processed) grew from 45 pounds in 1946 to 90 pounds in 1996. Today, frozen concentrated orange juice accounts for about 85 percent of U.S. orange consumption.

Product introductions are also of vital interest to the Nation's food retailers and manufacturers, helping

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Table 1

Despite the Drop in 1996, Food Product Introductions Rose an Average of 10 Percent a Year Since 1970

Category	1970	1981 ¹	1990	1994	1995	1996
<i>Number of product introductions</i>						
Food products:	1,041	1,796	10,301	15,006	16,863	13,266
Baby food	6	4	31	45	61	25
Bakery foods	93	229	1,239	1,636	1,855	1,340
Baking ingredients	55	58	307	544	577	419
Beverages	123	194	1,143	2,250	2,854	2,310
Breakfast cereals	8	18	123	110	128	121
Condiments	138	188	1,486	3,271	3,698	2,815
Candy, gum, and snacks	195	313	2,028	2,461	2,462	2,003
Dairy	64	246	1,327	1,323	1,614	1,345
Desserts	63	12	49	215	125	100
Entrees	116	188	753	694	748	597
Fruits and vegetables	31	72	325	487	545	552
Pet food	36	33	130	161	174	121
Processed meat	73	155	663	565	790	637
Side dishes	28	61	538	980	940	611
Soups	12	25	159	264	292	270
Nonfood products:	324	986	2,943	5,070	5,709	6,306
Health and beauty aids	201	838	2,379	4,368	4,897	5,702
Household supplies	62	71	317	426	472	290
Paper products	31	30	174	183	99	91
Tobacco products	28	41	31	38	102	54
Pet products	2	6	42	55	139	169
Total product introductions	1,365	2,782	13,244	20,076	22,572	19,572

Notes: ¹Data for 1980 is not available. Source: *New Product News*.

Table 2

The Number of New Low-Fat Food Products Continues To Grow

Food products	1990	1994	1995	1996
<i>Number of product introductions</i>				
Reduced/low calorie	1,165	575	1,161	776
Reduced/lowfat	1,024	1,439	1,914	2,076
All natural	754	575	407	645
Reduced/low salt	517	274	205	171
No additives/preservatives	371	251	167	143
Low/no cholesterol	694	372	163	223
Added/high fiber	84	26	40	12
Reduced/low sugar	331	301	422	373
Added/high calcium	20	23	21	35
Organic	324	446	538	645

Source: *New Product News*.

Table 3
Twenty Largest Food Companies Account for Only 11.5 Percent of Introductions

Company	1995	1996	Change
	<i>Number of product introductions</i>		<i>Percent</i>
Phillip Morris	169	191	+13
Unilever	117	128	+9
Nestle	163	125	-23
Grand Metropolitan	95	115	+21
Sara Lee	176	115	-35
CPC International	60	111	+85
Campbell Soup	135	83	-39
Wessanen USA	100	83	-17
ConAgra	157	78	-50
Hormel Foods	89	74	-17
Nabisco Brands	109	68	-38
Quaker Oats	59	55	-7
General Mills	88	52	-41
PepsiCo	32	47	+47
H.J. Heinz	73	42	-42
Borden	73	38	-48
Dean Foods	44	38	-14
M&M/Mars	67	32	-52
Hershey Foods	19	28	+47
Health Valley Foods	54	25	-54
Total	1,879	1,528	-19

Source: *New Product News*.

them to entice new customers and increase their sales, profits, and market shares. New product introductions are an important form of competition to which manufacturers may respond by holding down consumer prices. Successful new products also help manufacturers negotiate with retailers to acquire and retain scarce shelf space in stores.

New Products Compete for Scarce Shelf Space

New product introductions are one way food manufacturers compete for U.S. consumers. Yet there is limited shelf space in retail stores to accommodate all the new sizes, shapes, tastes, colors, and other attributes that result in a new prod-

uct. If there are already 320,000 products available to retailers, and a typical supermarket can accommodate only 50,000 products (including nonfood items), retailers must decide what products go on shelves. Some of the decision is based on turnover, which affects profitability and returns.

Widespread use of slotting allowances is helping retailers assure adequate returns when new products absorb scarce shelf space but do not sell well. Slotting allowances are fees charged to manufacturers by retailers for shelf space for new products. Some retailers feel they need this fee to protect their profitability. Manufacturers contend that the risk of a new product not selling well should be assumed by the entire food distribution system. Until recently, only small regional food manufacturers were charged slotting fees to stock a new product. However, even large companies with brand names have been paying these fees in recent years.

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Guillain-Barré Syndrome Increases Foodborne Disease Costs

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Guillain-Barré syndrome (GBS) is the leading cause of acute paralysis in the United States now that polio has been almost eliminated by vaccination programs. Although the causes of GBS are uncertain, many medical researchers believe that GBS is a reaction by a person's immune system responding to fight off several potential triggers, such as some gastrointestinal or respiratory infections. One trigger of GBS is *Campylobacter jejuni*, which is also the most common cause of foodborne diarrhea in the United States. Sources of *Campylobacter* primarily include raw and undercooked poultry, but raw milk and polluted water have also caused outbreaks.

Medical studies all over the world have confirmed that 20 to 40 percent or more of patients with GBS had become infected with *Campylobacter* in the 1 to 3 weeks prior to the onset of GBS symptoms. Of an estimated 2,658 to 9,575 patients diagnosed with GBS in the United States each year, 532 to 3,830 of the patients had a preceding *Campylobacter* infection.

Last year, USDA's Economic Research Service (ERS) estimated that seven foodborne illnesses in the United States cost society \$6.5 billion to \$34.9 billion (in 1995 dollars) in medical charges and lost productivity. These seven foodborne pathogens—*Campylobacter jejuni*, *Clostridium perfringens*, *E. coli* O157:H7, *Listeria monocytogenes*, *Salmonella*, *Staphylococcus aureus*, and *Toxoplasma gondii* (see box)—caused an estimated 3.3 million to 12.3 million cases of foodborne illness and up to 3,900 deaths in 1995. These seven pathogens were selected because they are primarily found on meat and poultry.

Researchers at the U.S. Food and Drug Administration estimate that 1 to 3 percent of all foodborne-illness cases later develop secondary illnesses or complications that can occur in any part of the body, including the nerves, joints, and heart. These complications may be chronic and may cause premature death. Societal costs have not been estimated for the majority of complications associated with foodborne illnesses. This article updates ERS's 1995 cost estimates to 1996 dollars using 1996 medical cost and wage rate data, and for the first time includes estimated costs of GBS in the *Campylobacter* estimates.

Costs of Foodborne Illness Depend on Severity

The cost-of-illness estimates are calculated from the number of annual foodborne-illness cases and deaths of the seven foodborne illnesses described in this article; the number of cases that develop select secondary complications; and the corresponding medical costs, lost productivity costs, and some other illness-specific costs, such as special education and residential-care costs.

Cases of foodborne illness generally fall into four severity groups: those who did not visit a physician, those who visited a physician, those who were hospitalized, and those who died prematurely because of their illness. A fifth severity group is for patients who develop select secondary complications from the acute illness. For each severity group, medical costs were estimated for physician and hospital services, supplies, medications, and special procedures unique to treating the particular foodborne illnesses. Such costs reflect the number of days/treatments of a medical service, the average cost per service/treatment, and the number of patients receiving such service/treatment.

The authors are economists with the Food and Rural Economics Division, Economic Research Service, USDA.

For those people with foodborne illnesses who miss only some days of work, lost productivity is approximated by wage rates, published by the Bureau of Labor Statistics. However, some patients die and some develop secondary complications so that they either never return to work, regain only a portion of their pre-illness productivity, or switch to less demanding and lower paying jobs. The total cost of lost productivity is the sum for all individuals affected, primarily the patients and,

in the case of ill children, their parents or costs for paid caretakers.

This update includes two sets of cost-of-illness estimates that use different proxies for the forgone earnings of someone who dies prematurely or who is unable to work because of their foodborne illness. The first set of estimates uses a human capital approach, where estimates of forgone earnings are adjusted by a "risk premium" from life-insurance markets. The second set of estimates uses less conserva-

tive values based on the "risk premium" revealed in labor markets through the higher wages employers must offer to induce workers to take jobs with injury risks. Under the human capital approach, the cost of a premature death is estimated, depending on age, to range from roughly \$15,000 to \$2,037,000 in 1996 dollars. The labor market approach places the value of preventing one premature death at \$5 million, regardless of age.

Study Considers Seven Foodborne Illnesses

Campylobacter jejuni

Campylobacteriosis ranges from a mild illness with diarrhea lasting a day, to severe abdominal pain, and severe diarrhea (sometimes bloody), sometimes accompanied by fever, occasionally lasting for several weeks. The incubation period for most cases is 2 to 5 days, and the illness usually lasts from 2 to 10 days, depending on its severity. Although the illness is generally regarded as a relatively mild disease, death can occur in some cases, especially for the very young, very old, or immunocompromised. A small percentage of cases develop Guillain-Barré Syndrome.

Clostridium perfringens

***C. perfringens* intoxication** typically occurs 6 to 24 hours after ingestion of food that bears large counts of this bacteria. The illness in humans is frequently a mild gastro-intestinal distress, lasting only around a day. Deaths are uncommon.

***Escherichia coli* 0157:H7**

***E. coli* 0157:H7 disease** is usually a mild gastrointestinal illness that occurs 3 to 5 days after eating contaminated food. Severe complications, however, can arise. Hemorrhagic colitis is distinguished by the sudden onset of severe abdominal cramps, little or no fever, and diarrhea that may become grossly

bloody. Although less than 5 percent of *E. coli* 0157:H7 disease cases develop hemolytic uremic syndrome (HUS), it is a severe, life-threatening illness. HUS is a disease characterized by red blood-cell destruction, kidney failure, and neurological complications, such as seizures and strokes. Most HUS cases are children under 5 years old, although the feeble elderly may also be at risk.

Listeria monocytogenes

Listeriosis may be either mild or severe. Milder cases are characterized by a sudden onset of fever, severe headache, vomiting, and other influenza-type symptoms. Listeriosis may appear mild in healthy adults and more severe in fetuses, the elderly, and the immunocompromised. Outbreak data show that the incubation period ranges from 3 to 70 days. Women infected with *Listeria* during pregnancy may transmit the infection to the fetus, possibly leading to stillbirths or babies born with mental retardation.

Salmonella

Salmonellosis usually appears 6 to 74 hours after eating contaminated food and lasts for a day or two. Common symptoms are nausea, diarrhea, stomach pain, and sometimes vomiting. Although the illness is generally regarded as a relatively mild disease, death can occur

in some cases, especially for the very young, very old, or immunocompromised.

Staphylococcus aureus

***S. aureus* intoxications** occur usually within 1 to 6 hours following consumption of the toxins produced by the bacteria, but it may occur within 30 minutes. Illness caused by *S. aureus* enterotoxin is characterized by severe nausea, vomiting, cramps, and diarrhea. Although the illness generally does not last longer than 1 or 2 days, the severity of the illness may indicate the need for hospitalization.

Toxoplasma gondii

Toxoplasmosis can cause mild flu-like symptoms, though most people infected with the parasite do not have any symptoms. People vary in their risk of getting sick from this parasite. People with suppressed immune systems, such as AIDS and cancer patients, face higher risks. One outbreak associated with undercooked meat indicates that the incubation period ranges from 10 to 23 days. Women infected with *T. gondii* during pregnancy may transmit the infection to their fetus, possibly leading to stillbirths or babies born with birth defects ranging from hearing or visual impairments to mental retardation.

Costs of *Campylobacter*-Associated Guillain-Barré Syndrome

Although GBS is a secondary complication in a small percentage of human *Campylobacter* infections, GBS is a severe illness. GBS is characterized by a rapid onset, various degrees of numbness, pain, progressive weakness or paralysis over 1 to 4 weeks, and gradual recovery in the first year or two. Almost all patients are hospitalized and some have relapses. Almost 80 percent of patients recover with only minor deficits and can return to normal life within a year. Others, however, are permanently bedridden, wheelchair-bound, or die prematurely because of the illness. Roughly 20 percent of GBS patients are left significantly disabled, and 2 percent die.

Like polio victims, some patients with GBS require mechanical ventilation to assist breathing. These patients tend to be older and tend to have a poorer prognosis. To capture differences in both the prognoses for younger and older GBS patients and the requirement for mechanical ventilation, we grouped GBS patients into two categories. Based on the average ages found by two physicians, Sunderrajan and Davenport, ventilated GBS patients are repre-

sented by a 47-year-old, and patients who did not require mechanical ventilation are represented by a 30-year-old.

Several neurologists specializing in GBS suggested we lower the overall death rate found by Sunderrajan and Davenport to 2 percent to reflect recent advances in medical care. This adjustment resulted in a total of 10 to 76 deaths each year from *Campylobacter*-associated GBS (fig. 1).

Annual productivity losses totaled across all six patient categories from *Campylobacter*-associated GBS in the United States range from \$0.2 billion to \$1.4 billion for the low and high estimate of the number of annual cases, respectively (table 1). These productivity losses for *Campylobacter*-associated GBS using the human capital approach are roughly three times larger than medical costs. Using the labor market approach, productivity losses are roughly 10 times larger than medical costs.

Annual medical costs include immune-globulin treatments, plasma exchange, regular hospital room fees, and intensive-care unit hospital room fees. Estimated annual medical costs range from \$61 million to \$438 million. Summing all medical and lost productivity costs provides an estimate of total annual

costs for *Campylobacter*-associated GBS ranging from \$0.3 billion to \$1.9 billion.

Roughly 55 to 70 percent of all *Campylobacter* infections are estimated to be foodborne. If 55 percent of all *Campylobacter*-associated GBS have foodborne origins, annual total costs are estimated to range from \$142 million to \$1 billion; if 70 percent are foodborne, total costs range from \$180 million to \$1.3 billion.

Foodborne Illnesses Impose High Costs

In 1996, there were an estimated 3.3 million to 12.4 million cases of the 7 foodborne illnesses in the United States and up to 3,700 associated deaths (table 2), including the *Campylobacter*-associated GBS cases. Total annual costs of the seven foodborne illnesses (in terms of medical costs and costs of lost productivity) in 1996 dollars ranged between \$6.6 billion and \$14.5 billion. These estimates are based on the human capital approach for the cost of a premature death. We use this approach because it is conservative and provides estimates for people of different ages. The \$5 million estimate of the cost of a premature death from the labor market studies increases total annual costs to between \$19.6 billion and \$37.1 billion (table 3). We

Table 1

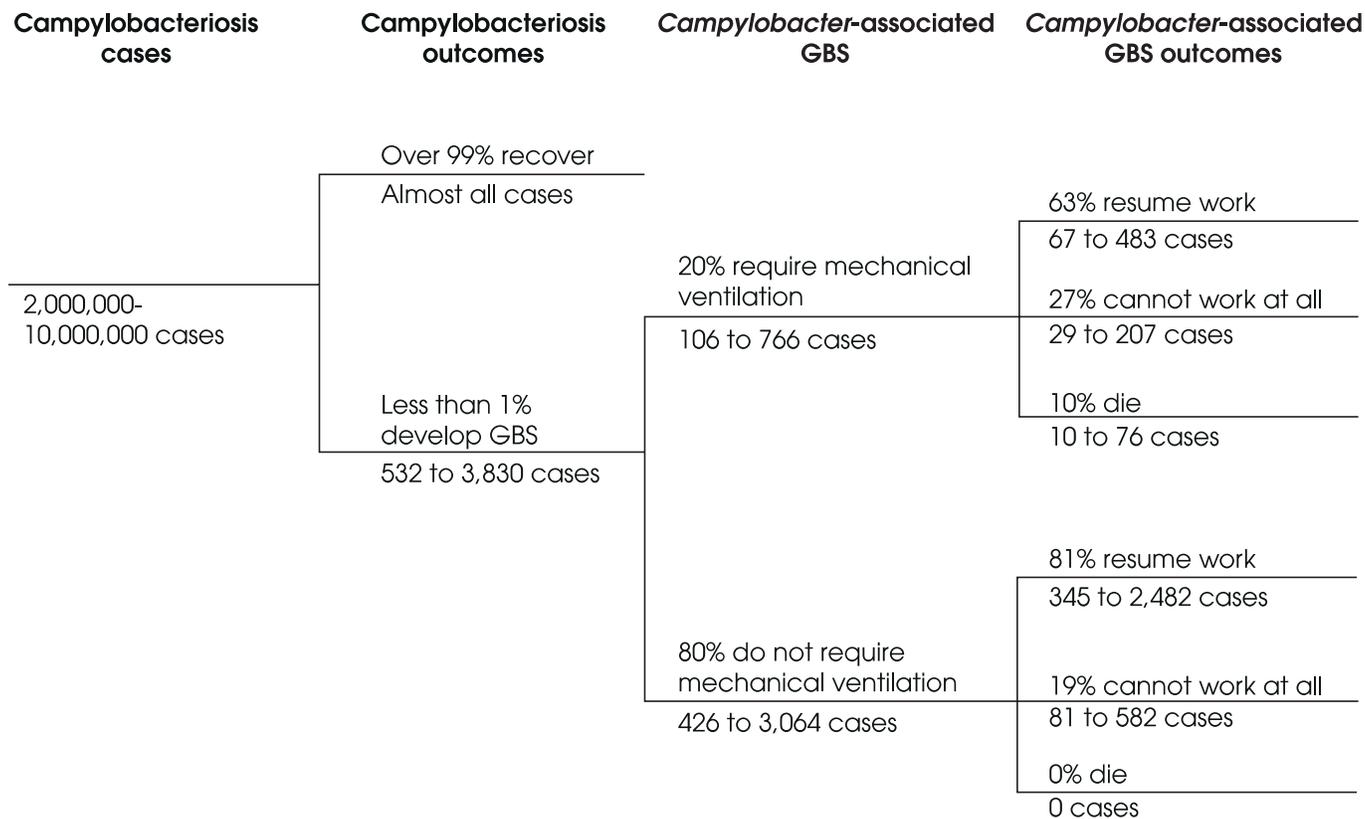
Paralysis Caused by *Campylobacter*-Associated Guillain-Barré Syndrome Imposes High Costs to Society¹

Source category	Patients		Deaths		Medical costs		Productivity costs		Total costs	
	Low	High	Low	High	Low	High	Low	High	Low	High
	Number		Million dollars		Million dollars		Million dollars		Million dollars	
All cases of GBS-associated <i>Campylobacter</i> infections	532-3,830	10-76	60.7	437.7	197.0	1,418.7	257.7	1,856.4		
If 55 percent are foodborne	293-2,107	6-42	33.4	240.7	108.4	780.3	141.7	1,021.0		
If 70 percent are foodborne	372-2,681	7-53	42.5	306.4	137.9	993.1	180.4	1,299.5		

Notes: ¹U.S. costs were estimated using the human capital approach and are in 1996 dollars. Figures may not total due to rounding.

Figure 1

Estimated Annual Cases and Disease Outcomes of *Campylobacter*-Associated Guillain-Barré Syndrome (GBS)



provide this second set of estimates because there is no consensus among researchers as to the best type of approach in calculating the cost of illness.

Both sets of estimates undervalue the true costs of foodborne illnesses to society, however, because the analyses covers only 7 of the more than 40 different foodborne pathogens believed to cause human illnesses. Estimated costs would also increase if the costs for all complications linked to foodborne illnesses, such as arthritis and meningitis,

were included. These estimates primarily include medical costs and lost productivity. Total costs would increase if we include other societal costs, such as pain and suffering, travel to medical care, and lost leisure time.

The wide range of costs is largely due to uncertainty about the true number of annual foodborne illness cases and associated deaths. Many people sick with diarrhea do not visit a doctor and even if they do, most will not have a stool culture taken—let alone have the specific test necessary to identify the

pathogen that caused the illness. The lab test may not find the pathogens. Even if a particular pathogen is implicated, not all culture-confirmed foodborne illnesses are reported to the Centers for Disease Control and Prevention (CDC), and these illnesses may not be traced back to a particular food source. Therefore, most foodborne illnesses go unrecorded. Better data could help narrow the ranges of cases and deaths and could provide information to calculate the costs of other foodborne pathogens.

Tracking Food-Related Disease Outbreaks

In July 1995, as part of the Federal Government's campaign to improve the safety of the Nation's food supply, USDA's Food Safety and In-

spection Service and the Food and Drug Administration began a collaborative project with the CDC. The project was originally known as CDC's Sentinel Site Study and more recently as FoodNet.

The project collects improved information on the incidence of foodborne disease in the United States by establishing direct working links with State and local health departments at seven sites nationwide: Minnesota; Oregon; and

Table 2
People Are Exposed to These Seven Pathogens in Food and Nonfood Sources

Pathogen, acute illness, and complication	Estimated total annual		Estimated share foodborne
	Cases	Deaths	
	Number		Percent
Bacteria:			
<i>Campylobacter jejuni</i> or <i>coli</i> —			
Campylobacteriosis	2,000,000-10,000,000	200-730	55-70
Guillain-Barré Syndrome	532-3,830	10-76	55-70
Subtotal	N/A	210-806	N/A
<i>Clostridium perfringens</i> —			
<i>C. perfringens</i> intoxications	10,000	100	100
<i>Escherichia coli</i> O157:H7—			
<i>E. coli</i> O157:H7 disease	20,000-40,000	50-100	80
Hemolytic uremic syndrome ¹	1,000-2,000	29-58	80
Subtotal	N/A	79-158	N/A
<i>Listeria monocytogenes</i> ² —			
Listeriosis	1,092-1,860	270-510	85-95
Complications	26-43	0	85-95
Subtotal	N/A	270-510	N/A
<i>Salmonella</i> (non-typhoid)—			
Salmonellosis	800,000-4,000,000	1,000-2,000	87-96
<i>Staphylococcus aureus</i> —			
<i>S. aureus</i> intoxications	8,900,000	2,670	17
Parasite:			
<i>Toxoplasma gondii</i> ³ —			
Toxoplasmosis	520	80	50
Complications	3,120	0	50
Subtotal	N/A ⁴	80	N/A
Total	11,700,000-23,000,000	4,400-6,300	N/A

Notes: N/A = Not applicable. Subtotal and totals may not add due to rounding. Totals are rounded down to reflect the uncertainty of the estimates. Nonfood sources include drinking or swimming in contaminated water and contact with infected people or animals.

¹Kidney failure. ²Includes only hospitalized patients because of data limitations. ³Includes only toxoplasmosis cases related to fetuses and newborn children who may become blind or mentally retarded. Does not include all other cases of toxoplasmosis. Another high-risk group for this parasite is the immunocompromised, such as patients with AIDS. ⁴Of the 4,000 infections from this parasite each year, 520 develop acute illness and later die prematurely or develop some degree of chronic complication because of the illness, and 2,680 do not have noticeable acute illness at birth but develop complications by age 17. Therefore, a total of 3,200 develop either acute illness, chronic complication, or both.

selected counties in California, Connecticut, Georgia, Maryland, and New York. Laboratories at these sites report weekly to CDC on the number of illnesses caused by certain pathogens.

These sites study foodborne illness outbreaks and explore the relationships between the outbreaks and certain types of food consumed. The major objectives of FoodNet are to:

- Determine the yearly incidence of diarrheal illness due to bacterial foodborne pathogens (such as *Campylobacter*, *E. coli* O157:H7, *Listeria*, *Salmonella*, *Shigella*, *Vibrio*, and *Yersinia*);

Table 3

Complications Were Important Contributors to Costs of Foodborne Illness in 1996¹

Pathogen, acute illness, and complication	Estimated annual foodborne illness		Estimated foodborne illness costs, assuming:	
	Cases	Deaths	Human capital approach ²	Labor market approach ³
	Number		Billion 1996 dollars	
Bacteria:				
<i>Campylobacter jejuni</i> or <i>coli</i> —				
Campylobacteriosis	1,100,000-7,000,000	110-511	0.7-4.4	1.2-6.7
Guillain-Barré Syndrome	293-2,681	6-53	.1-1.3	.4-3.4
Subtotal	N/A	116-564	.8-5.7	1.6-10.1
<i>Clostridium perfringens</i> —				
<i>C. perfringens</i> intoxications	10,000	100	.1	.5
<i>Escherichia coli</i> O157:H7—				
<i>E. coli</i> O157:H7 disease	16,000-32,000	40-80	.05-.1	.1-.2
Hemolytic uremic syndrome ⁴	800-1,600	23-46	.1-.2	.2-.4
Subtotal	N/A	63-126	.16-.3	.3-.7
<i>Listeria monocytogenes</i> ⁵ —				
Listeriosis	928-1,767	230-485	.12-.26	1.2-2.3
Complications	22-41	0	.03-.05	.1-.2
Subtotal	N/A	230-485	.1-.3	1.3-2.4
<i>Salmonella</i> (non-typhoid)—				
Salmonellosis	696,000-3,840,000	870-1,920	.9-3.6	4.8-12.3
<i>Staphylococcus aureus</i> —				
<i>S. aureus</i> intoxications	1,513,000	454	1.2	3.3
Parasite:				
<i>Toxoplasma gondii</i> ⁶ —				
Toxoplasmosis	260	40	.04	.1
Complications	1,560	0	3.28	7.7
Subtotal	N/A	40	3.3	7.8
Total	3,300,000-12,400,000	1,900-3,700	6.6-14.5	19.6-37.1

Notes: ¹Cost estimates are in 1996 dollars. N/A = Not applicable. Subtotal and totals may not add due to rounding. Totals are rounded down to reflect the uncertainty of the estimates. ²The Landefeld and Seskin approach is basically a human capital approach, increased by a willingness to pay multiplier, and estimates the cost of a premature death, depending on age, to range from roughly \$15,000 to \$2,037,000 in 1996 dollars. ³This labor market approach values the cost of a premature death at \$5 million. ⁴Hemolytic uremic syndrome (HUS) is characterized by kidney failure. HUS following foodborne *E. coli* O157:H7 infections causes 44-90 acute illness deaths and 33-62 chronic illness deaths. ⁵Includes only hospitalized patients because of data limitations. ⁶Includes only toxoplasmosis cases related to fetuses and newborn children who may become blind or mentally retarded. Some cases do not have noticeable acute illness at birth but develop complications by age 17. Does not include all other cases of toxoplasmosis. Another high-risk group for this parasite is the immunocompromised, such as patients with AIDS or cancer.

- Develop a network to collaboratively respond to emerging food-borne diseases;
- Determine the proportion of food-borne disease cases attributed to specific foods; and
- Determine whether Federal interventions are having a measurable effect on the incidence of food-borne illness attributable to consumption of meat, poultry, and other foods.

We will update our 1996 cost-of-illness estimates for *Campylobacter*, *E. coli* O157:H7, *Listeria*, and *Salmonella*, with FoodNet data, when available. The FoodNet data on the number of deaths and culture-confirmed cases from the seven sites will first have to be extrapolated to the U.S. population. Another possibility for improving our estimates includes performing cost-of-illness analyses using FoodNet data on *Shigella*, *Vibrio*, and *Yersinia*.

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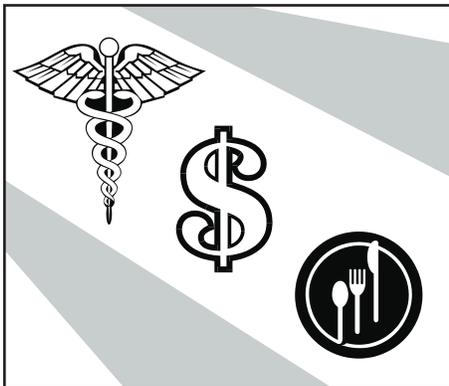
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At a Glance:

Domestic Food Assistance

During the first 6 months of fiscal 1997 (October 1996-March 1997), USDA's spending on domestic food-assistance programs declined to \$18.9 billion, almost 4 percent less than in the same period in fiscal

1996. If this trend continues for the entire year, it will mark the first decline in annual food-assistance program expenditures since fiscal 1982. In fiscal 1996, total food-assis-

tance expenditures grew about 1 percent over fiscal 1995.

Three programs—the Food Stamp Program, the National School Lunch Program, and the Special Supplemental Nutrition Program for

Table 1
Food-Assistance Program Outlays Decline in First Half of Fiscal 1997

Program	Fiscal 1996 expenditures		First half of fiscal 1997 expenditures ¹	
	Total	October-March	October-March	Change from half first of fiscal 1996
	Million dollars		Million dollars	Percent
Food stamp-related programs	25,473.9	12,873.8	11,813.4	-8.2
Food stamp program ²	24,325.8	12,299.7	11,223.9	-8.7
Nutrition assistance programs ²	1,148.1	574.1	589.5	2.7
Child nutrition programs ³	8,372.7	4,777.8	4,907.4	2.7
National school lunch	5,340.9	3,287.3	3,355.1	2.1
School breakfast	1,118.4	666.1	709.2	6.5
Child and adult care ²	1,533.8	775.6	796.9	2.7
Summer food service ²	249.7	4.1	NA	NA
Special milk	16.8	8.9	9.2	3.4
Supplemental food programs	3,784.5	1,820.7	1,970.2	8.2
WIC ²	3,685.2	1,773.5	1,917.8	8.1
Commodity supplemental food program ²	99.3	47.3	52.4	10.8
Food donation programs	307.8	151.6	196.2	29.4
Food distribution on Indian reservations ²	70.2	33.9	33.9	0
Nutrition program for the elderly	145.6	71.7	74.3	3.6
Disaster feeding	.7	.4	.2	-50.0
TEFAP ⁴	44.9	16.6	83.4	402.4
Charitable institutions and summer camps	11.0	8.7	4.3	-50.6
Soup kitchens and food banks ⁴	35.3	20.4	0	-100.0
All programs ⁵	38,044.4	19,676.7	18,938.3	-3.8

Notes: NA = Not applicable. ¹Data are reported as of March 1997 and are subject to revision. ²Includes administrative expenses.

³Total includes the Federal share of State administration expenses. ⁴In fiscal 1997, The Emergency Food Assistance Program (TEFAP) and the Food Donation Programs to Soup Kitchens and Food Banks were combined into a single program. They are reported under TEFAP.

⁵Total includes Federal food program administration expenses. Source: USDA's Food and Nutrition Service.

Women, Infants, and Children (WIC)—accounted for 87 percent of total food-assistance expenditures.

Most of the decrease in total food-assistance outlays during the first half of fiscal 1997 was due to the contraction of the Food Stamp Program. The program's outlays of \$11.2 billion during the first half of fiscal 1997 were 9 percent lower than the same period the previous year. This decrease was largely the result of the continuing decline in program participation, which fell from an average 25.9 million people per month during the first 6 months of fiscal 1996 to 23.8 million during the first half of fiscal 1997. Some of this decline in participation can be

attributed to the Nation's favorable economic conditions and low unemployment rate. However, the decrease in the number of Food Stamp Program participants probably was due also in part to the initial effects of the welfare reform legislation passed in 1996. The welfare reform law made most legal immigrants ineligible for food stamps by September 1997, and many of these may have been leaving the program gradually since the passage of the law in August 1996. Newly imposed time limits on benefit receipt by unemployed adults without children also have lessened the rolls in the first half of fiscal 1997.

Expenditures for the National School Lunch Program totaled \$3.4 billion in the first half of fiscal 1997, a 2-percent increase over the same period in fiscal 1996. WIC increased 8 percent to \$1.9 billion during the first half of fiscal 1997, reflecting a 5-percent increase in participation and a 4-percent increase in average per-person benefits.

Overall expenditures for food donation programs during the first half of fiscal 1996 increased 29 percent. However, there was a great deal of variation in the change in outlays for the individual programs. As a result of the Personal Responsibility and Work Opportunity Reconciliation Act of 1996, the Food Donation Program to Soup Kitchens and Food Banks and The Emergency Food Assistance Program (TEFAP) were combined into a single program. For reporting purposes, fiscal 1997 expenditures for this new program are reported under TEFAP.

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Processed Food Imports Up 11 Percent in 1996

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U.S. trade in processed foods (the sum of imports and exports) in 1996 rose 6.5 percent from 1995—somewhat smaller than the 10.7- and 8.6-percent jumps of the previous 2 years, but strong nonetheless.

Imports led the growth in 1996. Processed food imports averaged a 4-percent annual growth rate over the previous 5 years, but grew an astounding 11.2 percent in 1996 to \$27.8 billion. Exports, by comparison, grew only 2.5 percent to \$30.1 billion, well below their average growth rate for the past 5 years.

The processed food trade surplus (exports minus imports) amounted to \$2.4 billion, down from the record \$4.4 billion in 1995, but still the third largest on record (fig. 1). The 1996 surplus thus continues a pattern of positive balances begun in 1992. Given reasonable assumptions for U.S. economic activity, imports should have continued their strong growth in 1997. Export growth is expected to have rebounded in 1997 to about 4 percent, resulting in a trade surplus of under \$2 billion.

This article covers exports and imports of processed foods, bever-

ages, and related products that fall under Standard Industrial Classification Code 20 (SIC-20). SIC-20 contains 49 food processing industries. The processing may be minor, as in the case of fluid milk, or may be quite extensive, such as for frozen pizza.

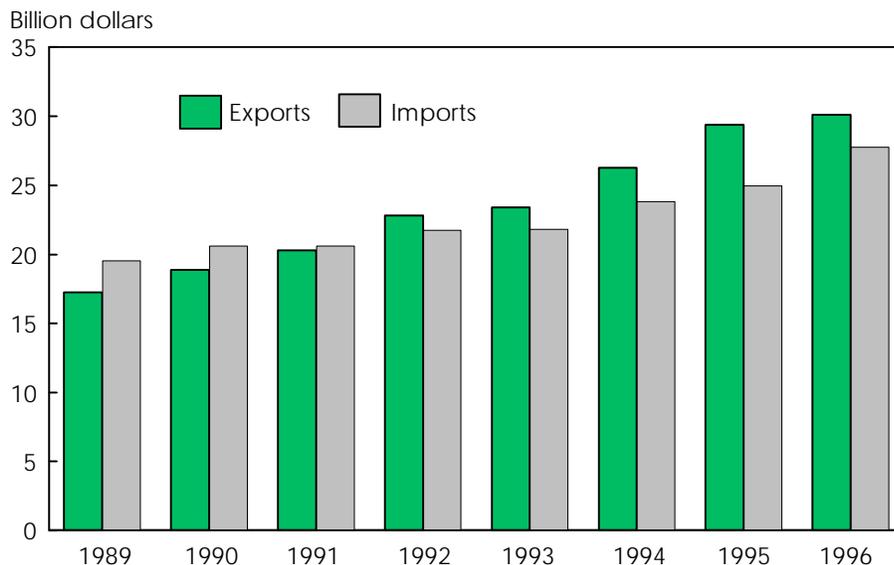
Export Growth Positive, But Smaller Than in Recent Years

Processed food exports continued to grow in 1996, but the 2.5-percent rate was below the average annual

growth of 9.3 percent for the previous 5 years.

Poultry processing registered the largest dollar value increase of the 49 industries—\$488 million over the level in 1995 (table 1). Poultry exports have been among the fastest growing in recent years, averaging a 31 percent growth per year for the past 3 years. With exports valued at \$2.6 billion in 1996, poultry surpassed fish and seafoods as the number two U.S. processed food export industry behind meatpacking, the clear export leader (\$6 billion in exports in 1996). Poultry exports to Russia alone rose from

Figure 1
The Value of the U.S. Processed Foods Trade Surplus Narrowed in 1996



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Table 1
Leading Processed Food Export Industries

Industry	Exports		Change	
	1995	1996	1994-95	1995-96
	Million dollars		Percent	
Meatpacking	6,100	6,008	20.5	-1.5
Poultry slaughtering and processing	2,097	2,585	28.5	23.3
Fresh or frozen fish and seafoods	2,719	2,488	5.3	-8.5
Soybean oil and meal	2,000	2,128	17.3	6.4
Wet corn milling (oil and syrup)	1,418	1,580	3.8	11.5
Canned fruits, vegetables, and jellies	1,012	1,035	16.1	2.3
Salted and roasted nuts and seeds	984	1,225	3.2	24.5
Miscellaneous food preparations	989	1,217	-8.5	23.1
Rice milling	908	912	-2.6	.5
Animal and marine fats and oils	1,039	889	39.2	-14.4
Frozen fruits, fruit juices, and vegetables	804	823	15.3	2.4
Flavoring, extracts, and syrups	681	787	-6.5	15.6
Distilled and blended liquors	744	687	22.9	-7.6
Dried fruits, vegetables, and soup mixes	651	675	4.8	3.7
Prepared animal feed	650	593	7.8	-8.7
Dry, condensed, and evaporated milk	595	544	12.5	-8.5
Pet food	433	534	12.1	23.4
Malt beverages	526	453	34.5	-13.8
Vegetable oil, except corn, cottonseed, and soybean	543	437	69.8	-19.6
Canned and cured fish and seafoods	426	421	-.1	-1.4
Chocolate and cocoa products	356	400	-7.0	12.3
Flour and grain mill products	439	349	13.2	-20.5
Wines, brandy, and brandy spirits	246	330	22.2	34.1
Pickled vegetables, sauces, and salad dressings	255	282	8.4	10.7
Cane and beet sugar ¹	304	238	21.3	-21.7
Bread and other bakery products	220	230	-6.1	4.4
Potato chips, corn chips, and similar snacks	226	222	-10.2	-1.8
Soft drinks and carbonated waters	306	215	-4.6	-29.8
Roasted coffee	182	199	28.2	9.4
Candy and other confectionery products	171	189	3.6	10.6
Cereal breakfast foods	169	177	-8.2	5.1
Sausage and prepared meats	123	148	-14.6	21.0
Prepared flour mixes and doughs	109	139	-7.4	27.9
Shortening, table oils, and margarine	122	136	27.4	10.8
Cookies and crackers	109	116	2.6	5.9
Natural, processed, and imitation cheese	89	105	24.5	17.2
Ice cream and frozen desserts	87	94	-3.4	7.7
Canned specialties	88	87	-6.4	-1.1
Cottonseed oil	107	80	6.5	-25.4
Chewing gum	60	62	-16.7	3.5
Frozen bakery products, except bread	53	62	9.0	16.4
Frozen specialties	59	57	-3.5	-2.9
Malt	42	45	40.1	5.5
Creamery butter	63	42	-41.9	-33.7
Fluid milk	38	42	-44.1	11.2
Macaroni, spaghetti, vermicelli, and noodles	41	42	3.8	4.1
Manufactured ice	8	4	-8.7	-41.4
Total, all industries	29,390	30,116	12.0	2.5

Note: ¹Combines three cane and beet sugar industries into one industry.

Table 2

Japan and Canada Are the Largest Markets for U.S. Processed Foods

Market	Exports		Share of SIC-20 exports	Cumulative share of SIC-20 exports	Change	
	1995	1996			1994-95	1995-96
	Million dollars		Percent		Percent	
Japan	7,557.9	7,209.8	23.9	23.9	12.3	-4.6
Canada	4,201.7	4,548.7	15.1	39.0	4.7	8.3
Mexico	1,649.1	2,005.3	6.7	45.7	-31.4	21.6
South Korea	1,664.9	1,511.0	5.0	50.7	29.1	-9.2
Russia	968.2	1,281.9	4.3	55.0	65.5	32.4
Hong Kong	1,013.0	1,116.6	3.7	58.7	30.0	10.2
The Netherlands	919.1	935.9	3.1	61.8	12.0	1.8
United Kingdom	742.1	828.3	2.8	64.5	9.4	11.6
Taiwan	781.0	753.9	2.5	67.0	14.8	-3.5
Germany	596.1	731.3	2.4	69.5	11.3	22.7

\$84 million in 1993 to \$914 million in 1996, accounting for 35 percent of U.S. poultry exports. Other major consumers of U.S. poultry include Hong Kong, Japan, and Mexico.

Six other industries had export gains of more than \$100 million in 1996: salted and roasted nuts, miscellaneous food preparations, wet corn milling (oil, starch, and high-fructose corn syrup), soybean oil, beverage flavorings and concentrates, and pet food. Wines, brandy, and brandy spirits had the largest percentage jump (34.1 percent) over its 1995 export value, and prepared flour mixes and doughs increased 27.9 percent. However, both of these industries are relatively small, with a combined value of only 1.5 percent of total U.S. processed food exports.

The top 3 exporting industries (meatpacking, poultry, and fish) were responsible for 37 percent of total processed food exports in 1996, while the top 10 industries accounted for two-thirds of U.S. exports.

The Netherlands, United Kingdom, and Germany are all among the top 10 markets for U.S. processed food exports, and U.S. exports have grown substantially to each of these countries during the

1990's (table 2). Germany is new to the top 10 this year, replacing China. The value of U.S. processed food exports to Germany grew 22.7 percent in 1996, reflecting big increases in nuts, wine, soybean oil, rice milling, and pet foods.

Among the top 10, the largest export growth was to Russia, a 32.4-percent increase over 1995, followed by Germany (22.7-percent increase), and then Mexico (21.6-percent increase). Major exports to Mexico include meat and poultry products, animal and marine fats and oils, wet corn milling products such as high-fructose corn syrup, and soybean oil milling products (soybean oil, cake, meal, and concentrate). The large export growth to Mexico comes on the heels of a 31-percent decline in 1995 due largely to the peso devaluation in December 1994, which made U.S. imports more expensive for Mexican consumers. Beginning in 1996, the Mexican economy began recovering, with gross domestic product (GDP) growing over 5 percent, making food imports from the United States more affordable.

Eighteen of the 49 processed food industries had lower exports in 1996 than in 1995, and another 12 had growth rates below the average

annual growth of exports for the previous 5 years. Only two of the industries with yearly exports over \$1 billion suffered declines—meatpacking (which includes shipments from both beef and pork packing plants) and fresh/frozen fish and seafoods. However, because meatpacking is the largest U.S. export industry, even its small decline of 1.5 percent amounted to a \$92-million decrease. Nearly all of this decline was due to lower beef exports to Japan, South Korea, and Taiwan due to concerns over the possibility of pathogens in meat and other food safety concerns and the strength of the dollar against the South Korean won. The decline in fresh/frozen fish and seafood was even more sizable, \$230 million, as fish and seafood exports to Japan declined for the same reasons as for beef.

Although Japan continues to be the largest export market for U.S. processed foods, with 24 percent of total 1996 processed foods exports, the value of U.S. shipments to Japan fell 4.6 percent in 1996. U.S. food exports to three other Asian trading partners (South Korea, Taiwan, and China) fell as well between 1995 and 1996. Shipments to China fell 14.9

percent, due primarily to a decline in purchases of soybean oil.

Among the top 50 destinations, the largest percentage growth by far was to Latvia, a 267-percent increase over 1995 totals. Much of this increase likely was resold to Russian merchants. Finland was second, with an 86-percent increase, followed by Israel at 54 percent. The largest declines among the top 50 were to Algeria, down 61.5 percent; Brazil, down 41.6 percent; and Egypt, down 27.6 percent.

Strong U.S. Economy Boosts Imports

The strong import growth was largely due to rising U.S. per capita incomes and the high value of the dollar against many of the world's major currencies. Inflation-adjusted incomes of Americans rose an average of about 2 percent in each of the last couple of years, while in 1996 the dollar rose about 16 percent against the Japanese yen and 5 percent against the German mark. As the U.S. dollar appreciates, imported goods become relatively less expensive for U.S. consumers.

Imports for 33 of the 49 food industries increased by 10 percent or more in 1996 (table 3). Many of these industries, however, started from a fairly small base. For example, imports of prepared flour and flour mixes increased 50 percent from \$40 million to \$60 million, while ice cream imports also increased 50 percent from \$2 million to \$4 million. Of the larger industries, cane sugar became a billion-dollar import in 1996, as a result of a 57.7-percent increase over 1995 import levels. The United States increased sugar import quotas in 1996 due to poor sugar beet crops in 1994 and 1995. Cane sugar imports came primarily from the Dominican Republic, Brazil, Australia, Guatemala, and the Philippines. Cane sugar also registered the largest dollar value increase in imports of all 49 indus-

tries, going from \$760 million in 1995 to \$1.2 billion in 1996.

Chocolate and cocoa products (\$1.4 billion in imports) and wines, brandy, and brandy spirits (\$1.7 billion) also had large percentage increases, 26.6 percent and 23.0 percent, respectively. Major sources of chocolate and cocoa imports were Ivory Coast, Canada, and Indonesia.

Other billion-dollar import industries with double-digit import growth included vegetable oil (\$1.5 billion, up 18.7 percent), canned fruits and vegetables (\$1.7 billion, up 15.1 percent), malt beverages (\$1.3 billion, up 12.5 percent), miscellaneous food preparations (\$1.1 billion, up 11.7 percent), and distilled and blended liquors (\$1.7 billion, up 10.6 percent).

Imports fell in 1996 for only two processed foods industries—fresh/frozen fish and seafood, and sausage and other prepared meats. As with exports, imports are highly concentrated, with the top 3 industries—fish, meatpacking, and canned fruits and vegetables—accounting for 35 percent of U.S. processed food imports (while the top 10 account for 71 percent). Three of the top 10 industries were meat and fish products industries, accounting for 33 percent of total U.S. processed food imports, and three were alcoholic beverages industries, constituting 17 percent.

Canada dominates as a source for U.S. processed food imports (table 4). The United States imported \$5.7 billion in foods and beverages from Canada in 1996, more than one-fifth of total U.S. processed food imports. This was more than three times as much as the United States imported from Mexico, the second leading source country. Leading imports from Canada are red meat products, fresh/frozen fish, vegetable oils, distilled liquors, and chocolate products. Primary imports from Mexico include fresh/frozen fish, malt beverages, frozen fruits and vegetables, and distilled liquors. Thailand,

France, and Italy are also billion-dollar import sources. The United Kingdom, The Netherlands, Brazil, New Zealand, and Australia round out the top 10 source countries. These 10 countries supplied 57 percent of U.S. imports of processed foods. Only two countries in the top 10—Thailand and Australia—reduced their shipments to the United States.

Among the top 10 countries, Brazil and Italy were the fastest growing import sources, with 23.4- and 21.9-percent increases over 1995 import totals, respectively. The largest imports from Brazil were frozen fruits and vegetables, cane sugar, salted and roasted nuts, and chocolate and cocoa products. Italy was a major source of wine, vegetable (mostly olive) oil, cheese, and pasta. Among the top 50 import sources, the leading growth countries were Ivory Coast, Bangladesh, and Guatemala, at 97, 67, and 63 percent, respectively.

Imports Provide Enhanced Variety

In 1996, U.S. consumers spent \$27.8 billion on processed food imports—approximately \$1 on imports for every \$24 spent on domestic foods. There were 11 food processing industries where U.S. consumers spent at least \$1 billion on imported products.

Many groups, including the news media, trade associations, and public officials, extol the employment and income benefits of exports, while downplaying or even attacking imports. Exports provide additional employment opportunities for U.S. workers and allow some firms to lower costs by achieving greater economies of scale. However, imports also serve a useful function in any economy, and provide numerous benefits to consumers. Trade is a two-way street. Importing food from other countries, especially developing countries, strengthens

Table 3
Leading Processed Food Import Industries

Industry	Imports		Change	
	1995	1996	1994-95	1995-96
	<i>Million dollars</i>		<i>Percent</i>	
Fresh or frozen fish and seafoods	5,616	5,434	2.0	-3.2
Meatpacking	2,494	2,498	-11.7	.2
Canned fruits, vegetables, and jellies	1,503	1,731	11.5	15.1
Wines, brandy, and brandy spirits	1,402	1,724	10.6	23.0
Distilled and blended liquors	1,550	1,714	5.1	10.6
Chocolate and cocoa products	1,106	1,400	9.2	26.6
Vegetable oil, except corn, cottonseed, and soybean	1,241	1,473	21.0	18.7
Malt beverages	1,192	1,341	11.1	12.5
Cane and beet sugar ¹	760	1,199	7.4	57.7
Canned and cured fish and seafoods	1,075	1,173	3.7	9.2
Miscellaneous food preparations	978	1,093	12.5	11.7
Frozen fruits, fruit juices, and vegetables	567	731	-15.6	29.0
Dry, condensed, and evaporated milk	503	621	41.2	23.5
Natural, processed, and imitation cheese	549	584	11.9	6.4
Salted and roasted nuts and seeds	410	445	-2.7	8.4
Candy and other confectionery products	381	417	28.8	9.3
Soft drinks and carbonated waters	319	388	-.4	21.5
Bread and other bakery products	351	360	6.1	2.5
Pickled vegetables, sauces, and salad dressings	283	319	4.8	12.7
Roasted coffee	282	301	30.1	6.5
Wet corn milling (oil and syrup)	241	285	-9.2	18.0
Dried fruits, vegetables, and soup mixes	245	274	-4.7	11.9
Macaroni, spaghetti, vermicelli, and noodles	257	269	7.9	4.5
Prepared animal feed	203	246	12.3	20.8
Cookies and crackers	192	224	12.1	16.8
Rice milling	128	163	-5.9	27.6
Animal and marine fats and oils	116	150	-16.8	29.0
Sausage and prepared meats	161	136	3.6	-15.4
Pet food	101	127	20.0	25.8
Cereal breakfast foods	101	122	11.8	21.2
Flavoring, extracts, and syrups	114	119	39.4	4.4
Flour and grain mill products	86	106	-6.1	22.7
Chewing gum	83	85	16.4	3.0
Soybean oil and meal	53	83	0.6	58.6
Shortening, table oils, and margarine	71	82	45.9	15.9
Frozen bakery products, except bread	60	76	38.1	27.0
Prepared flour mixes and doughs	40	60	44.5	50.9
Canned specialties	54	57	16.1	6.2
Poultry slaughtering and processing	31	45	20.6	46.3
Potato chips, corn chips, and similar snacks	24	30	-3.1	22.2
Manufactured ice	19	26	17.4	37.5
Malt	19	23	50.5	20.5
Creamery butter	1	9	-33.9	556.5
Fluid milk	5	9	4.1	93.2
Frozen specialties	6	6	49.2	4.4
Ice cream and frozen desserts	2	4	78.9	50.9
Cottonseed oil	0	1	-97.3	253.1
Total, all industries	24,974	27,761	4.9	11.2

Note: ¹Combines three cane and beet sugar industries into one industry.

Table 4

Canada Is Also the Largest U.S. Import Source

Source	Imports		Share of SIC-20 imports	Cumulative share of SIC-20 imports	Change	
	1995	1996			1994-95	1995-96
	Million dollars		Percent		Percent	
Canada	4,898.6	5,662.4	20.4	20.4	5.6	15.6
Mexico	1,603.4	1,795.6	6.5	26.9	24.1	12.0
Thailand	1,603.1	1,584.4	5.7	32.6	-4.9	-2.8
France	1,231.2	1,374.3	5.0	37.5	12.4	11.6
Italy	1,073.1	1,307.9	4.7	42.2	15.1	21.9
United Kingdom	811.4	903.2	3.3	45.5	9.7	11.3
The Netherlands	807.7	841.6	3.0	48.5	13.6	4.2
Brazil	677.3	836.0	3.0	51.5	-15.9	23.4
New Zealand	796.5	782.4	2.8	54.3	2.3	-1.8
Australia	735.7	715.5	2.6	56.9	-18.5	-2.7

their businesses and economies and also provides needed cash to use in buying foreign products.

Food imports increase the domestic supply of that product, thereby lowering the domestic product price and increasing domestic consumption. Domestic consumers benefit from the lower prices. They also enjoy a more stable supply of the product, since imports can fill gaps created by shortfalls or seasonal lulls in domestic production.

Some food imports are used as ingredients in the production of other foods in the United States. For example, cocoa is not produced in the United States, but is imported in large quantities to make chocolate and chocolate products.

Some domestic producers (and their employees) are hurt by import competition. Naturally, domestic producers facing foreign competition will want to maintain their market share and may search for ways to lower their production costs, typically through cost-cutting measures, increased productivity, or by importing inputs and ingredients at lower costs than on the domestic market.

Imports provide consumers with a greater variety and range of choice. Many consumers are willing to pay

a higher price for an imported product that is a near-perfect substitute for a domestically produced good, simply because they want a change. Americans consume Danish hams, French wines, and Swiss chocolates, even though Smithfield, Gallo, and Hersheys are major domestic producers and exporters of similar products. And, many U.S. consumers purchase imported beers, even though the U.S. brewing industry is large and comparable beers are available. U.S. beer imports amounted to \$1.34 billion in 1996. However, with \$435 million in exports, beer also ranked as one of the stronger processed food export industries (ranking 18th out of 49 industries).

Having both exports and imports within similar industries is a common phenomenon for processed foods and beverages. Meatpacking, prepared fresh/frozen fish and seafood, and canned fruits and vegetables are on the top 10 list for both exports and imports. Several other industries had record exports and imports simultaneously in 1996, including: natural processed cheese; cookies and crackers; frozen bakery products; wet corn milling; pet food; candy and confections; chocolate

and cocoa; salted and roasted nuts; wines, brandy, and brandy spirits; beverage flavorings and concentrates; roasted coffee; and pasta.

Import and export flows within the same industry show how the processed food sector is truly a global market, with consumers in many countries enjoying each others' bounty. Consumers benefit not only from a wider array of products, but also from greater rivalry among sellers. This enhanced rivalry in turn encourages product, production, and distribution innovations and efficiency, improved quality, and competitive prices.

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